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THE ARCHITECTS' JOURNAL

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standard contents

every issue does not necessarily contain all these contents, but they are the regular features which continually recur

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No. 3159] [VOL. 122

THE ARCHITECTURAL PRESS

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★ A glossary of abbreviations of Government Departments and Societies and Committees of all kinds, together with their full address and telephone numbers. The glossary is published in two parts—A to Ie one week, Ig to Z the next. In all cases where the town is not mentioned the word LONDON is implicit in the address.

AA	Architectural Association, 34/6, Bedford Square, W.C.1.	Museum 0974
AAI	Association of Art Institutions. Secy.: W. Marlborough Whitehead, "Dyneley," Castle Hill Avenue, Berkhampstead, Herts.	
ABS	Architects' Benevolent Society. 66, Portland Place, W.1.	Langham 5721
ABT	Association of Building Technicians. 5, Ashley Place, S.W.1.	Victoria 0447-8
ACGB	Arts Council of Great Britain. 4, St. James' Square, S.W.1.	Whitehall 9737
ADA	Aluminium Development Association. 33, Grosvenor Street, W.1.	Mayfair 7501/8
ArchSA	Architectural Students' Association. 34/36, Bedford Square, W.C.1.	
ARCUK	Architects' Registration Council. 68, Portland Place, W.1.	Langham 8738
BAE	Board of Architectural Education. 66, Portland Place, W.1.	Langham 5721
BATC	Building Apprenticeship and Training Council. Lambeth Bridge House, S.E.1.	Reliance 7611, Ext. 1706
BC	Building Centre. 26, Store Street, Tottenham Court Road, W.C.1.	Museum 5400
BCC	British Colour Council. 13, Portman Square, W.1.	Welbeck 4185
BCCF	British Cast Concrete Federation. 105, Uxbridge Road, Ealing, W.5.	Ealing 9621
BCIRA	British Cast Iron Research Association. Alvechurch, Birmingham.	Redditch 716
BDA	British Door Association. 10, The Boltons, S.W.10.	Fremantle 8494
BEDA	British Electrical Development Association. 2, Savoy Hill, W.C.2.	Temple Bar 9434
BIA	British Ironfounders' Association. 145, Vincent Street, Glasgow, C.2.	Glasgow Central 2891
BID	Building Industries Distributors. 52, High Holborn, W.C.1.	Chancery 7772
BINC	Building Industries National Council. 11, Weymouth Street, W.1.	Langham 2785
BOT	Board of Trade. Whitehall Gardens, Horseguards Avenue, Whitehall, S.W.1.	Trafalgar 8855
BRDB	British Rubber Development Board. Market Buildings, Mark Lane, E.C.3.	Mansion House 9383
BRS	Building Research Station. Bucknalls Lane, Watford	Garston 2246
BSA	Building Societies Association. 14, Park Street, W.1.	Mayfair 0515
BSI	British Standards Institution. British Standards House, 2, Park St., W.1.	Mayfair 9000
BTE	Building Trades Exhibition. 4, Vernon Place, W.C.1.	Holborn 8146/7
CABAS	City and Borough Architects Society. C/o Johnson Blackett, F.R.I.B.A., Civic Centre, Newport, Mon.	Newport 65491
CAS	County Architects' Society. C/o F. R. Steele, F.R.I.B.A., County Hall, Chichester.	Chichester 3001
CCA	Cement and Concrete Association. 52, Grosvenor Gardens, S.W.1.	Sloane 5255
CCP	Council for Codes of Practice. Lambeth Bridge House, S.E.1.	Reliance 7611
CDA	Copper Development Association. Kendals Hall, Radlett, Herts.	Radlett 5616
CIAM	Congrès Internationaux d'Architecture Moderne. Doldertal, 7, Zurich, Switzerland.	
COID	Council of Industrial Design. 28 Haymarket, S.W.1.	Trafalgar 8000
CPRE	Council for the Preservation of Rural England. 4, Hobart Place, S.W.	Sloane 4280
CUC	Coal Utilization Council. 3, Upper Belgrave Street, S.W.1.	Sloane 9116
CVE	Council for Visual Education. 13, Suffolk Street, Haymarket, S.W.1.	Reading 72255
DGW	Directorate General of Works, Ministry of Works, Lambeth Bridge House, S.E.1.	Reliance 7611
DIA	Design and Industries Association. 13, Suffolk Street, S.W.1.	Whitehall 0540
DPT	Department of Overseas Trade. Horseguards Avenue, Whitehall, S.W.1.	Trafalgar 8855
EJMA	English Joinery Manufacturers' Association (Incorporated). Sackville House, 40, Piccadilly, W.1.	Regent 4448
EPNS	English Place-Name Society. 7, Selwyn Gardens, Cambridge.	
FAS	Faculty of Architects and Surveyors. 68, Gloucester Place, W.1.	Welbeck 9966
FASS	Federation of Association of Specialists and Sub-Contractors, Artillery House, Artillery Row, S.W.1.	Abbey 7232
FBBDO	Fibre Building Board Development Organization, Ltd. 47, Princes Gate, Kensington, S.W.7.	Kensington 4577
FBI	Federation of British Industries. 21, Tothill Street, S.W.1.	Whitehall 6711
FC	Forestry Commission. 25, Savile Row, W.1.	
FCMI	Federation of Coated Macadam Industries. 37, Chester Square, S.W.1.	Sloane 1002
FDMA	The Flush Door Manufacturers Association Ltd. Trowell, Nottingham.	Ilkeston 623
FLD	Friends of the Lake District. Pennington House, nr. Ulverston, Lancs.	Ulverston 201
FMB	Federation of Master Builders. 26, Great Ormond Street, Holborn, W.C.	Chancery 7583
FPC	The Federation of Painting Contractors, St. Stephen's House, S.W.1.	Whitehall 3902
FRHB	Federation of Registered House Builders. 82, New Cavendish Street, W.1.	Langham 4041
GBPA	Gypsum Building Products Association, 11, Ironmonger Lane, E.C.2.	Monarch 8888
GC	Gas Council. 1, Grosvenor Place, S.W.1.	Sloane 4554
GG	Georgian Group. C/o R. H. Davies, F.R.I.B.A., 44, Lowndes Street, S.W.1.	Belgravia 3081
HC	Housing Centre. 13, Suffolk Street, Pall Mall, S.W.1.	Whitehall 2881
IAAS	Incorporated Association of Architects and Surveyors. 75, Eaton Place, S.W.1.	Sloane 5615
ICA	Institute of Contemporary Arts. 17-18, Dover Street, Piccadilly, W.1.	Grosvenor 6186
ICE	Institution of Civil Engineers. Great George Street, S.W.1.	Whitehall 4577
IEE	Institution of Electrical Engineers. Savoy Place, W.C.2.	Temple Bar 7676
IES	Illuminating Engineering Society. 32, Victoria Street, S.W.1.	Abbey 5215



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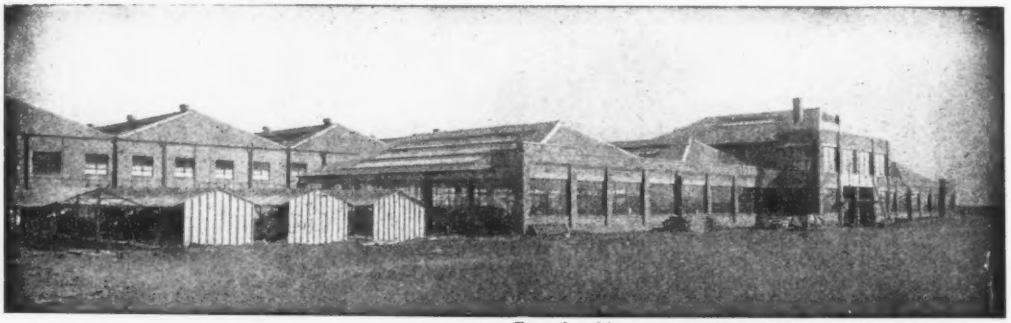
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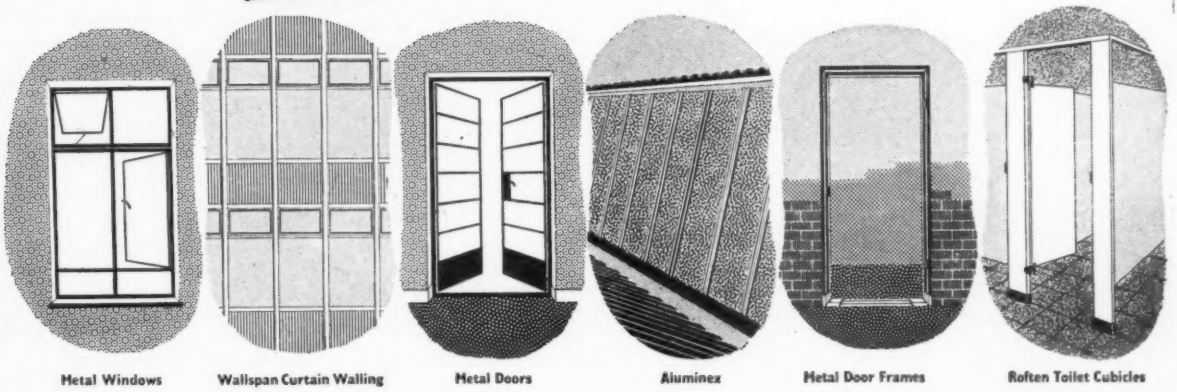


The contract that got away

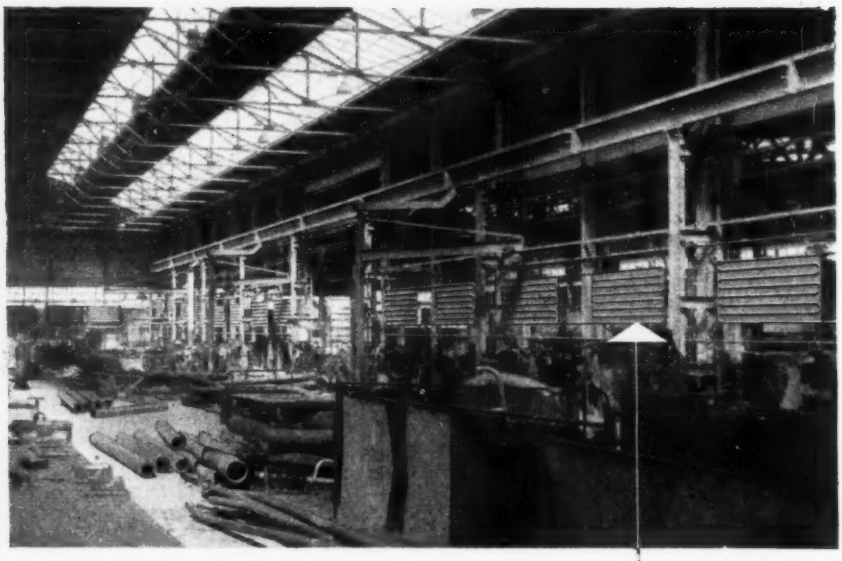
One of the pleasant things about a Williams & Williams Area Manager (or representative for that matter) is his *lack* of high pressure salesmanship. Peter Buckingham* who manages the Crawley Office covering Kent, Sussex and Surrey will cheerfully admit to the contract that got away—after a lot of time spent on preparatory work in his drawing office. "But that sort of thing is all part of the Williams & Williams service" says Mr. Buckingham, looking extraordinarily like one of those casual gentleman farmers. "We're here to help the architect get the best out of our products, not to sell an extra window or two."

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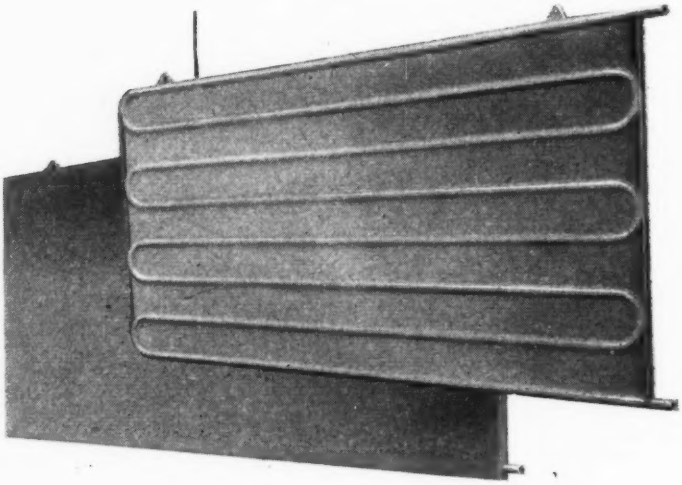
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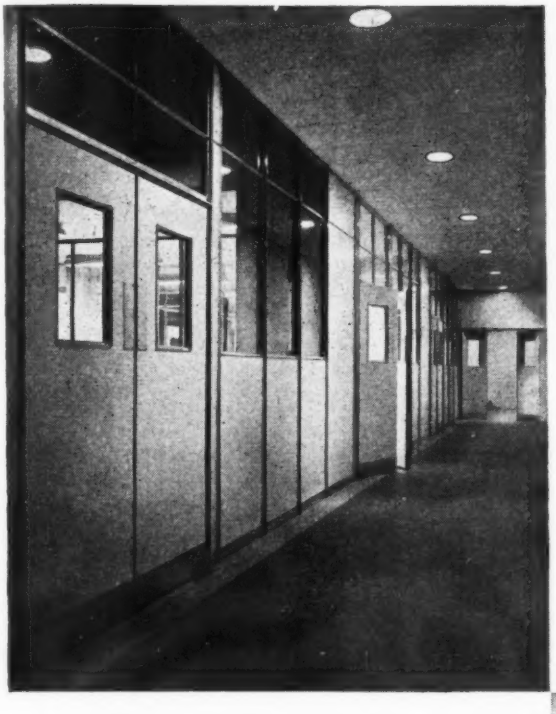
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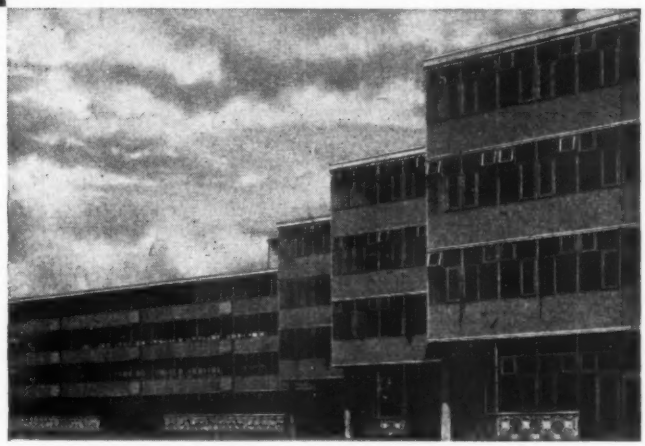
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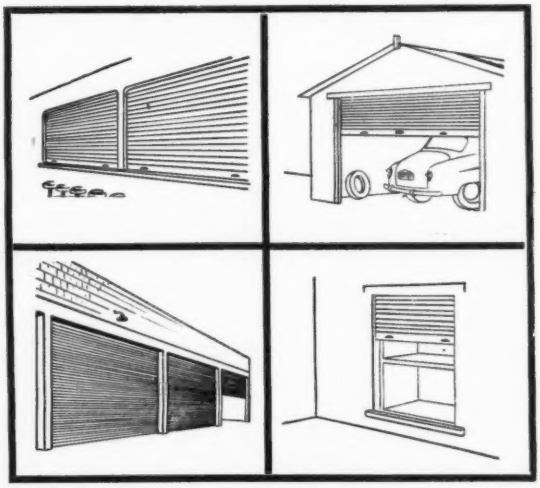
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at Vällingby, the Swedes don't seem to have solved the problem of preventing parked cars from playing too obtrusive a part in the urban landscape. It may be that the accompanying picture (taken from the central square) is a little unfair, because when the town is finished other parking sites may be provided, but the picture does show what an unfortunate foreground to architecture close-packed shiny metal roofs provide. And even if there are other car-parks they will be equally visible. The right solution, of course, in places like this, is to put car-parks in internal courts where they are out of sight, though this may mean an uneconomic increase in the built-up area of the centre.



Flats in 11-storey point blocks grouped round the town centre of Vällingby the new town near Stockholm. See ASTRAGAL'S *note, "Swedish New Town" and page 317.*



ASTRAGAL *comments below on this new stamp.*

*

It is said that at Vällingby the town-planners had to increase the space given to parking (by moving back some of the shops) after building had begun owing to an unexpected growth of motor-traffic, but this is in one way a tribute to the attractiveness of the town. Puzzled by the number of cars using the town centre the authorities took a census, and by tracing registration numbers they found that many cars came from far afield because of the attractiveness of the shops.

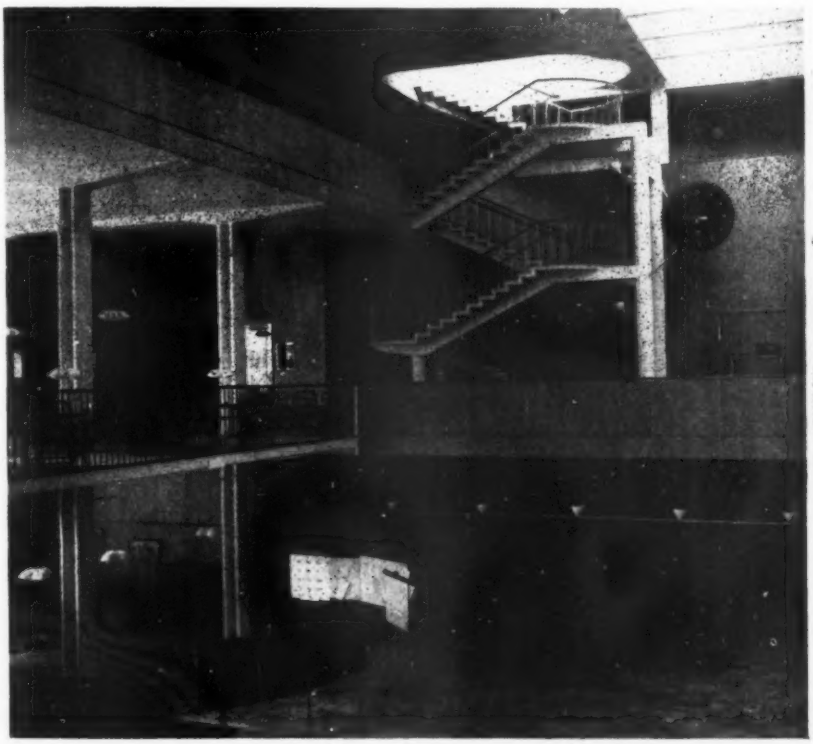
BACK TO THE PENNY BLACK

Though he is all for architecture ASTRAGAL was somewhat dismayed when he heard that the GPO had put four pieces of it into the new high value postage stamps: namely, the castles of Windsor, Edinburgh, Caernarvon and Carrickfergus. Not only do these appear in a glittering vignette by the side of their Sovereign, but they are seen through an architectural framework, a "broken grotto." Left is a specimen of the new British £1 stamp, which will be black. This design is an advance on the cliffs of Dover and HMS *Victory*, the only travel-poster subjects which have previously found their way into our august stampages: but ASTRAGAL feels that this kind of romanticism is out of place here and that the GPO were on the right track when they first invented postage stamps 115 years ago and made them restrained and formal.

*

Lighton Lamb, the designer, has been somewhat indecisive in his treatment of the background to the Queen's head. This surely should either have been a continuation of the stonework, or a markedly contrasting tone. Mr. Lamb has relied on merely altering the direction of the hatching. It may not be clear from the reproduction that the drawing appears to be *engraved*. The method of reproduction, of course, is by photogravure.

ASTRAGAL



Art & Technics continue their series of miniature architectural biographies with a study by Eric de Maré—perhaps our best exponent on Swedish architects and buildings—of the life and work of Gunnar Asplund. In the brief fifty-five years of his life Asplund changed from an almost orthodox classicism to being the chief advocate of functionalism. His early maturity in the new style is shown in the view, right, of the hall of the Gothenburg Law Courts extension (1937). (Art & Technics, 10s. 6d.)



E 55, Energy: Man and Universe

E 55, the Dutch exhibition which took as its theme, "Energy: Man and Universe," closed on September 3. From entrance to exit the grounds were a blaze of colour in the tradition of Mondriaan—steel girders, handrail tubes, timber frames painted in bright colours against a background of white or neutral walls, trees and grass. Above is an aerial view of the astronomy section, including cosmorama, planetarium, inter-planetary navigation and inter-planetary pavilions. The co-ordinating architects for the whole exhibition were Van den Broek and Bakema.



COMPETITION

Sanctuary of the Madonna delle Lacrime, Syracuse

An international competition for architects and engineers is being organized by the Working Committee of the Sanctuary of the Madonna delle Lacrime, Syracuse, for the construction of the Sanctuary and adjoining buildings in Syracuse; these include a parish hall, first aid post, orphanage for 200 children and a schoolhouse. First prize: 8 million lire (rate of exchange is between 1,736 and 1,762 lire to the £ sterling), second prize: 4 million lire, third prize: 2 million lire. The competition will be judged by a commission consisting of the Archbishop in office in Syracuse, two foreign members, two Italian members, the chief engineer of the Civil Engineering in Syracuse, the chief engineer of the Province of Syracuse, the chief engineer of the Municipality of Syracuse, an engineer designated by the Pontifical Commission of Sacred Arts, and a priest chosen by the Archbishop from amongst the members of the Metropolitan Chapter of Syracuse.

The closing date for receipt of plans is not later than 8 p.m. on April 30, 1956. Full details can be obtained from the above Committee at Viale L. Cadorna, on a deposit of 2,000 lire.

TUC

Epstein to be Commissioned

Sir Jacob Epstein is to be commissioned to create a group of statuary for the new TUC headquarters in Bloomsbury (Architect: David Du R. Aberdeen). The suggested theme is the work and sacrifice of trade unionists as servicemen and civilians in the two world wars. This decision follows the failure of the TUC's sculpture competition of last year, when none of the designs submitted was considered adequate.

RIBA

Architecture by Law

A committee of seven, under the chairmanship of Kenneth M. B. Cross, honorary secretary, was appointed by the RIBA Council in June, 1954, with the object of considering whether it was now both opportune and practicable to take definite steps towards further implementation of the Architects (Registration) Acts. Their first task was to obtain information as to the legislative position in other countries, and

(*Continued on page* 314)

POINTS FROM THIS ISSUE

A **new town** in **Sweden** pages 307, 309 and 317

The **Rotterdam** Exhibition pages 310, 313 and 314

RIBA's comments on **amateur architects** page 311

Another letter about the **COID** page 312

A **school** beside a **jet airfield** page 319

The Zurich **lighting conference** page 335

The Editors

THE ARCHITECT, THE PLANNING OFFICER, AND THE AMATEUR

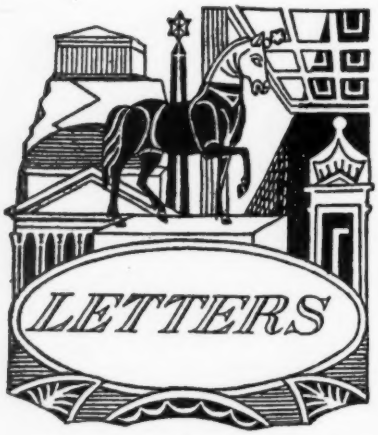
ON this page we publish two recent statements by the RIBA Council. One, to which we referred last week in a leading article, concerned a statement made by a special committee appointed to consider "whether it was now both opportune and practicable to take definite steps towards further implementation of the Architects (Registration) Acts." This means, presumably, to discover whether the country would support an Act making it obligatory for architects to be employed in the designing of buildings. The Council approved the findings of the committee that "the time is not as yet ripe for such a move."

The RIBA Council also considered a report from the Allied Societies Conference on the treatment by planning officers "of plans submitted by unqualified persons which may prove unacceptable." The complaint was that many planning officers and their staff take away work from private architects by redesigning, and then approving, unacceptable schemes submitted. The Council take the view that planning officers should limit themselves to "constructive criticism" and suggest that those who submit unsuitable schemes should be advised to consult a "qualified architect."

This proposal, however, does not quite answer the problem. The man who submits a design to a planning officer has almost certainly made up his mind that he cannot afford, or does not want to afford, the services of an architect. If he knows enough to be able to sketch out a design, and has the confidence to submit his design to a planning officer he is not going to be impressed by advice to seek an architect. He probably appreciates that the design he is submitting is similar to buildings which have actually been built. He knows that in all probability the lay committee behind the planning officer would accept his design without hesitation. It is obvious that a planning officer cannot stand firm on every badly designed building. To do so would cause such hold ups, such chaos, that he would soon be reprimanded—or taken out of his job.

He has two alternatives, assuming that the advice to consult an architect is ignored: he can pass the design as it stands, or he can endeavour to introduce sufficient amendments to the design to enable it to be built minus its more glaring errors. Such action, while reprehensible from the architect's standpoint, is surely commendable from the standpoint of society at large.

One would have thought that the realization by the Council of the planning officers' predicament, and that the MOHLG cannot officially condone the planning officers' action of actually drawing out designs, would have provided a strong enough case, if not for the further implementation of the Architects (Registration) Act, at least for a ministerial decision that a design which fails to be accepted on its first submission must be submitted again only over the signature of an architect.



Walter Boissevain
A director of Merchant Adventurers Ltd.

Derek Phillips, *Consultant architect British Thomson Houston*

R. K. Howard

COID Defended

SIR,—As an impartial observer, I hasten to spring to the defence of the Council of Industrial Design as the result of your editorial in the issue of August 11.*

Whilst I delight in the pungent views of the JOURNAL, and am glad so see that the COID's work merits the editorial space devoted, I do think that the opinions expressed in this instance are largely illogical.

Your policy for the COID based on reviewing only designs that statisticians have proved will sell, would, if applied to the JOURNAL, result in your confining the majority of the space reserved for housing to the spec. builders' contribution. And you recommend a similar proposition to "Design"!

I believe that on the whole, the Council, on what is probably an inadequate budget (one of your recommendations would make wholly inadequate), does a good job. And I suggest that its relation to industrial design should be somewhat similar to that of the critic to the theatre, the critic not being interested in box office results but in the play itself.

Where the Council's journal "Design" may be inadequate, is that the comment is not sufficiently searchingly critical. In my opinion, now that good standards of design are sufficiently well established, it would be a good thing if, as in the case of the theatre, a more virile criticism—libel laws permitting—was prevalent.

I suspect that your own criticisms arise out of a certain respect for the Council's work, a feeling of frustration that it cannot do more, and that, like all of us, it is not wholly perfect. But a little sharp-shooting at carefully chosen targets would, I think, have been preferable to the general broadside you have produced.

WALTER BOISSEVAIN.

London.

[Mr. Boissevan's attempt to equate product-criticism with theatre-criticism is a familiar red herring in arguments of this kind. The theatre-critic deals with a highly specialized product aimed at an audience which, on the scale of the nation as a whole, is tiny and idiosyncratic (the same is true, of course, of the section of the nation which reads the ARCHITECT'S JOURNAL) and the financing of the organizations which stage the sort of plays that theatre-critics actually criticize is not at all like that of the consumer-goods industries.

But the criticism of mass-produced and mass-consumed goods is in no way comparable to that of plays or specialist furnishings—and if these products can be compared to anything it is to films, or other media of mass-entertainment. There is no reason to suspect that the application of standards more appropriate to the specialist theatre has rendered one body of film-critics completely out of touch with the native standards of the films as mass-entertainment. This is not to be taken as justifying the resentful hostility shown by the film trade to the Sunday-paper critics, any more than one can defend the unthinking hostility of some manufacturers to COID. But one should note that the kind of criticism which is heeded in the film trade is that which appears in the mass-circulation dailies and fan-magazines, and serves—often quite accidentally—to interpret, explain, reinforce or even anticipate the results of Market Research. It is our suggestion that if COID could throw this kind of imaginative and prophetic light on the movements of the product market then they might gain a hearing in that field where—to repeat—their real problem lies; mass-production and mass-consumption. EDITORS.]

The Archcrome Range Of Colours

SIR,—I am writing to ask whether one architect's experience of the extent to which the Ministry of Education range of colours has been accepted by the paint industry is typical.

Recently in the course of several small redecoration jobs I have specified colours from the "archcrome" range and on each occasion I have been told by the building contractor that it is impossible to obtain colours to this specification from their normal stockists. On enquiring around the various paint companies I have now found a few of the smaller companies who can supply the paint with reasonable delivery periods but these are the exception rather than the rule, for in the most part the range is not stocked and has to be made up to order.

In the main distribution centre of one of the leading companies in London I was informed that their sales staff had never heard of the archcrome range, and "what did I want another range of colours for anyway." In their showroom the House and Garden Colours were, however, prominently displayed.

I hope that my experience is not born out by the experience of others with a similar desire to use this range of colours, for as a tool for architects it is of less value if it is not acceptable for "stocking" purposes by the paint industry.

This is all the more relevant at present with the introduction of the new "101 colours," developed by the RIBA in conjunction with representatives of the paint industry. This has, I understand, been accepted by the British Standard Institute and publication of the range, which includes a large proportion of the original archcrome colours, is scheduled for late October.

Should my experience of the disinclination of the paint industry to produce the archcrome range for stock be typical, I can only express the hope that the new range will be exploited by the industry with less reserve, and that methods of publicizing its use may be found, since it comes from a public demand for a colour range more in tune with present decorative trends.

DEREK PHILLIPS.

London.

Support For Study Of Management and Contracts

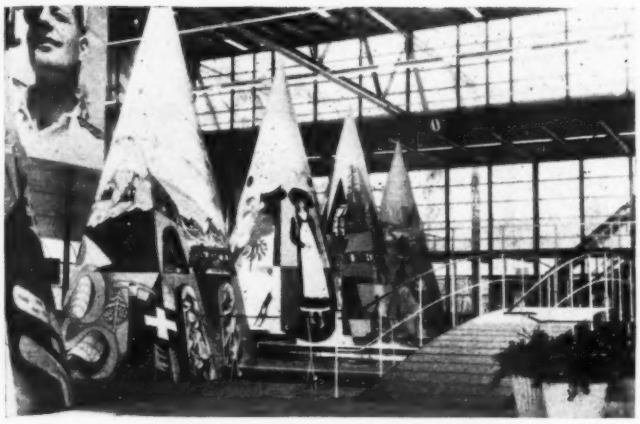
SIR,—For some years now I have felt that a study group on the lines proposed by Messrs. Brunton, Baden, Hellard & Partners (AJ: July 21) would fill a long-felt want.

I myself would welcome the chance to take part in such a scheme.

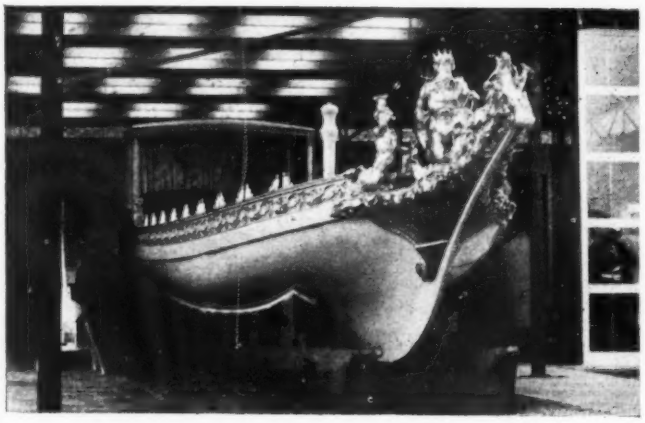
R. K. HOWARD.

Penge.

* See also page 244, August 25.







E55 EXHIBITION

ROTTERDAM

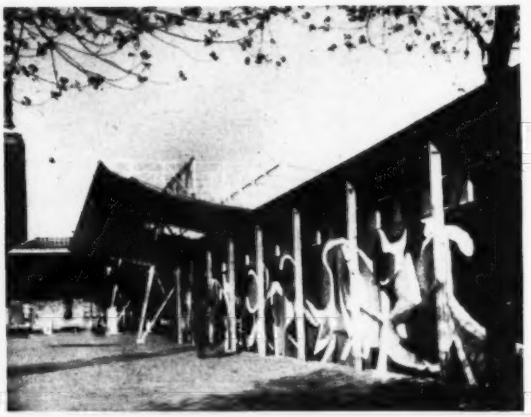
E55, a recent exhibition which had little publicity, was centrally placed between the Mathenesserlaan, a main street running south-west from the city centre of Rotterdam and the River Maas, with Boymans Museum along the eastern side. Like the Festival of Britain, the site was cut in two by a main traffic artery, in this case the Westzeedijk. Unlike the Festival of Britain, however, there were no permanent buildings, and structures consisted mainly of light steel sections with simple timber floors and railings, wood-wool or canvas roofs. Amongst the principal attractions outside the exhibits was an overhead cable way strung right across the exhibition, and a cascade of water on to a perspex parabolic arch over a light bridge. Apart from these, and other tours-de-force, the success of the exhibition lay in the straight-forward simplicity of presentation, facilitating the ready absorption of a mass of complicated facts. Top left is the drinking-water works section of the shipping and water pavilion, designed by the architect R. H. Fledderus. The temporary nature of the exhibition can be clearly seen in the materials used, light frames, canvas covers, light decking etc. Centre, a general view of the Mathenesserlaan side of the exhibition, grouped around the national pavilion. Behind it are the shipping, steel and building pavilions designed by Fledderus, Oyeraar, Stolle, Van den Broek and Bakema. In the right foreground is a swimming pool with underwater observation panels, and in the square adjoining is one of the many small refreshment bars. The ceremonial barge shown below was typical of the siting and high quality of the exhibits (*continued overleaf*).

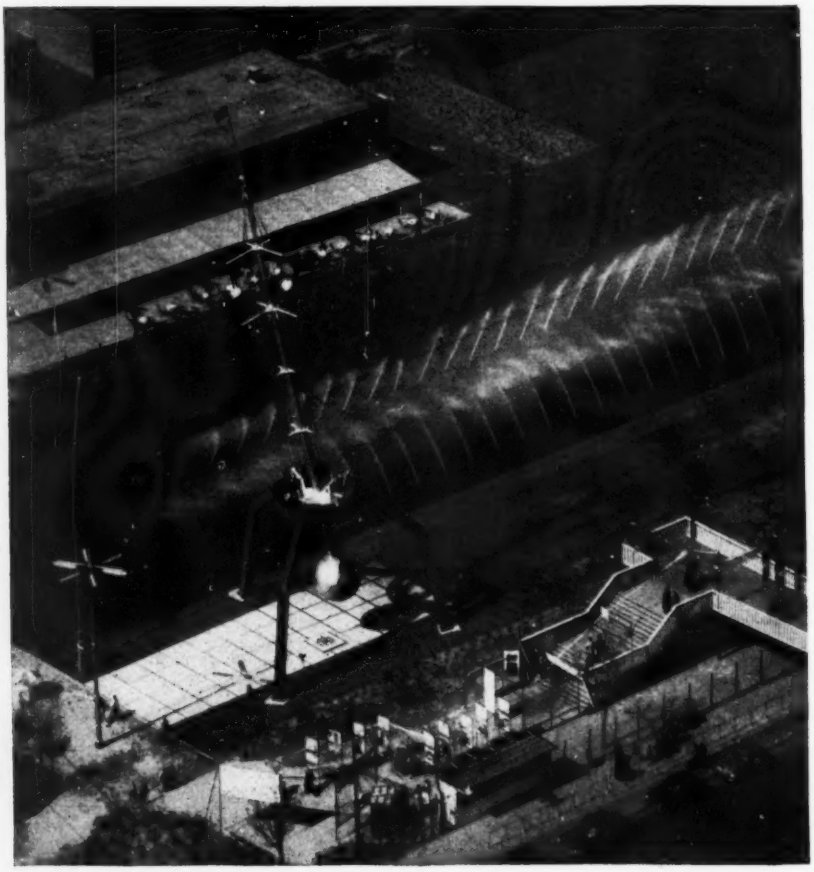
E 5 5

continued



Top right: an aerial view of the fun fair set in trees and water. Centre right, is the main entrance to the exhibition, showing the convex canvas canopy over the turnstiles, and, right foreground, the north wall of the "Netherlands in the World" pavilion, with a brilliantly coloured abstract mural throughout its length. In the background is the Boymans Museum. Bottom is the Aeolian mast, with the bridge of knowledge over the Westzeedijk. Beyond the mast can be seen the Ahoy restaurant.





News—(*Continued from page* 311)

then to review the present position in the UK.

The Committee have made their report to the Council. The Committee's review of the position in other countries states that any extensive implementation of the Acts amounting to restricting the right to design all buildings to architects only would be much in advance of the world situation. The Committee also considered the situation within the United Kingdom in regard to the various interests that would be affected and the procedure that would be required to obtain legislative action.

The Committee stated that they were convinced that the time is not as yet ripe for such a move. The Council approved the findings of the Committee, but in so doing they say that they have not in any way departed from their ultimate policy of further implementation of the Architects (Registration) Acts.

Advice to Planning Officers

The RIBA Council have considered a report from the Allied Societies' Conference on the treatment by the officers of planning authorities of plans submitted by unqualified persons which prove unacceptable. It is said that many Planning Officers, especially those who are qualified architects, in their desire to be of assistance to the public, are tempted to go beyond what might be thought the limits of their duty by re-designing and re-drawing the plans, which they then return to the applicant with the grant of planning approval.

In the minds of the Council, the following considerations are of importance. If building owners are encouraged to rely upon the free services of public authorities which they have no statutory right to enjoy, it means that there will be that much less work for qualified architects. Secondly, it is open to question whether it is proper for an architect, a member of an office which itself has to exercise a judicial function in approving or rejecting plans, to reformulate a plan and give it the approval of that office.

The Council therefore take the view that Planning Officers should limit themselves to constructive criticism of unsuitable schemes, but falling short of the free provision of drawings from which buildings can be constructed. Those who submit unsuitable schemes ought to be advised to consult a qualified architect. The RIBA Council hope that architects who are members of advisory panels, and others whose activities bring them into contact with the machinery of planning approval, will make these views known.

Special Final Examination Age Limit

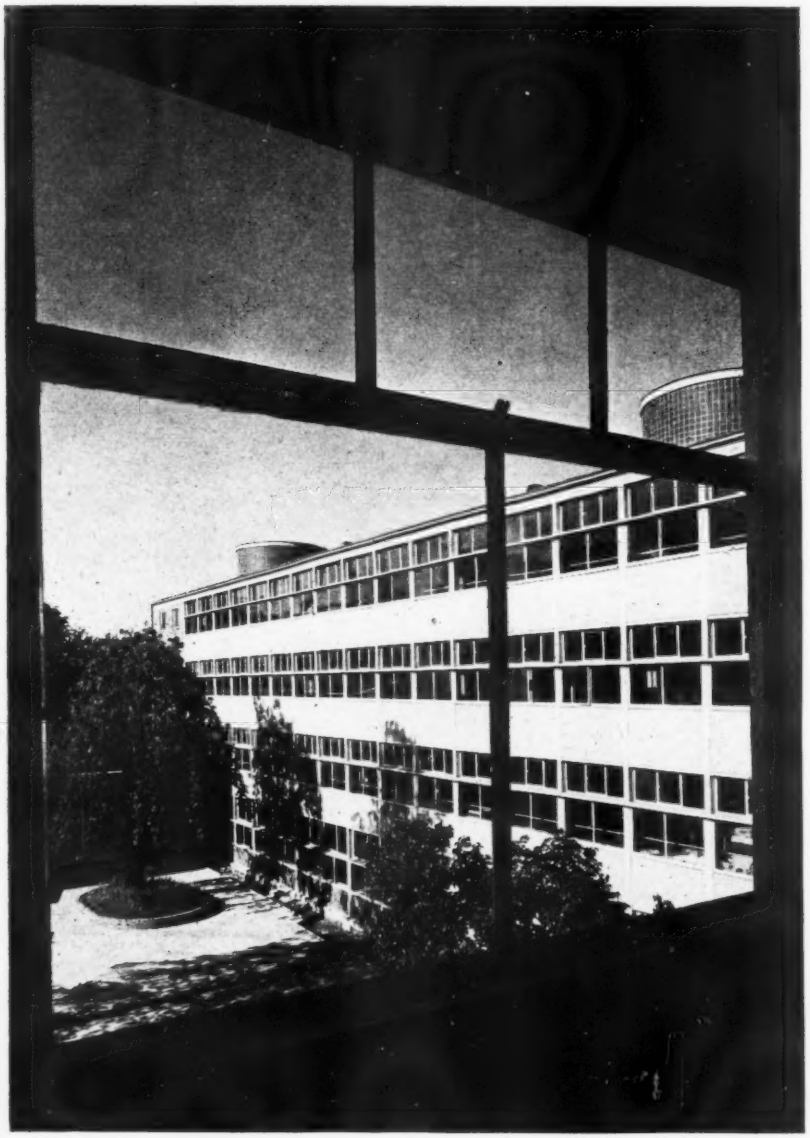
Candidates who intend to apply for admission to the RIBA Special Final Examination have been told by the Council of the Royal Institute that it has been decided that the minimum age limit will be raised from 30 to 35 with effect from January 1, 1958.

DIARY

Building a House. Two talks by David Jenkins, F.R.I.B.A. In Woman's Hour on the BBC Light Programme. 2 p.m.
SEPTEMBER 9 AND 15

International Conference on Regional Planning. At Bedford College, London. Registration fee £3. Information from Norman J. Hart, 45, Northcote Avenue, W.5. SEPTEMBER 29-OCTOBER 2

WOODBERRY DOWN SCHOOL, STOKE NEWINGTON, LONDON, N.4



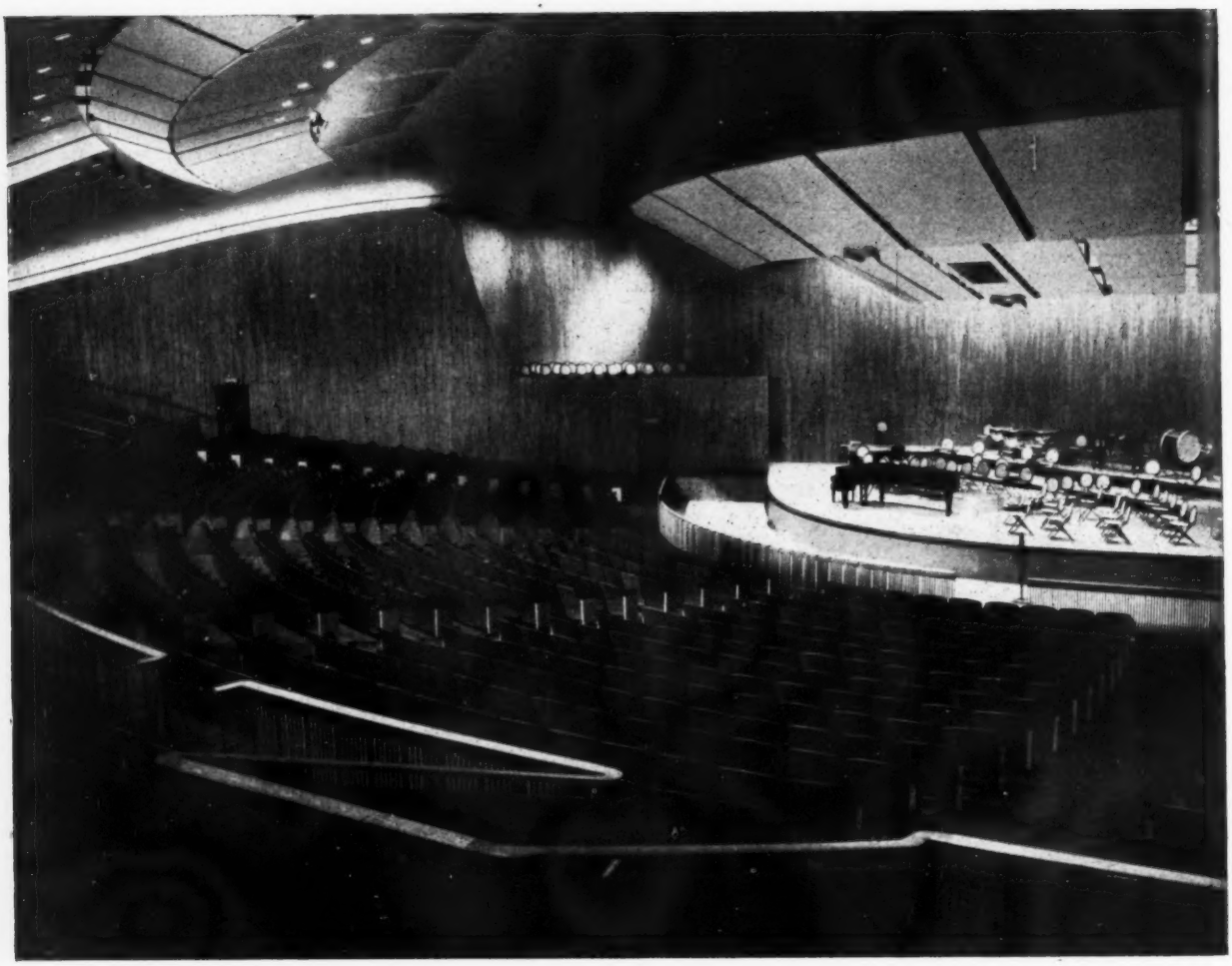
In the assembly hall and single-storey buildings, the frame is covered with a brick skin. Floor construction: composite slabs in the multi-storey blocks are made up of pre-cast, pre-stressed plank units, pre-cast trough units, and in situ *topping. Planks are* $3\frac{3}{4}$ *in. deep,* 22 *in. wide and spaced at* 7 *ft.* 8 *in. centres, spanning up to* 26 *ft. No shuttering is required in this system, but planks are propped at* 6 *ft. centres until the topping hardens. Roof construction: the pitched roof over the assembly hall is a latticed steel skin structure* 8 *ft. deep, spanning an hexagonal area* 83 *ft.* × 75 *ft. The gymnasia roof, which will be illustrated in a future Working Detail, is a folded "W" section slab, with a span of* 34 *ft. Upstand diaphragms at each end of the span collect the forces and transfer them to the* in situ *columns. Primary heat for calorifiers, air heater batteries, radiators, convectors and radiant radiators is provided by* 3 *oil-fired cylindrical tubular type boilers.*

The main contractors were Kirk and Kirk Ltd. Below: the link between the three-storey blocks and the assembly hall extreme right. The incised slate slab set in the courtyard pool was part of the South Bank Exhibition.

Woodberry Down School, the LCC's new mixed secondary school for 1,250 *pupils at Stoke Newington was designed by Professor Robert H. Matthew, former architect to the LCC, with F. J. Samuely as consulting engineer. Work was begun in November,* 1950, *and the total cost, including equipment, will be about* £535,000. *Teaching facilities include* 46 *classrooms and laboratories,* 12 *workshops and practical rooms. The school consists of* 4 *three-storey blocks, (one is shown above), administration wing, an assembly hall, and* 2 *two-storey gymnasia. All blocks, except the caretaker's house, are framed structures in reinforced concrete. Where frames are exposed they are painted and infilling walls are either purple or yellow stock facings or pre-cast concrete panels faced with white spar or crushed gravel.*



THE KRESGE AUDITORIUM, MASSACHUSETTS



M.I.T.'s new Kresge Auditorium was designed by Eero Saarinen and Associates, in conjunction with Anderson and Beckwith of Boston. The main hall, shown above, seats 1,238 and the stage can accommodate 250 players, together with a loft for 75 choristers. The structure is fundamentally a vast concrete shell 3½ in. thick—proportionately thinner than an egg shell—and the total live load of 1,500 tons is transmitted through three springing points via a heavy steel pintle and bearing, to mass concrete underground buttresses. Expansion and contraction is quite considerable and allowance for 4 in. of movement is made in some connections between shell and main walls. The dome necessitated several acoustic devices to disperse sound waves, chief amongst these being the rectangular baffles which can be seen above the stage. Extensive facilities for T.V. recordings have been incorporated and up to six cameras may be installed for one performance. Below the main auditorium is a small theatre seating 214, two large rehearsal rooms and the air-conditioning plant, which also makes ice for a nearby rink. Concrete shell construction: *3½ in. min. thickness at apex, topped with 2-in. cinder concrete, felt membrane, 2-in. glass wool and an asphalt fabric. The final layer of ¼-in. acrylic plastic mixed with sand and fibreglass will give the dome a weathered limestone appearance. The finished thickness at the apex is about 8 in., developing to 20 in. at the springing points. Left is the interior of the foyer with the main entrance to the hall on the right and one of the dome's springing points to the left. The paved fore-court and parking space can be seen beyond.*



A NEW TOWN, VÄLLINGBY, NEAR STOCKHOLM

Apart from its intrinsic interest, this new town holds special interest for British architects because of its similarity, in programme and purpose, to the new towns now being built around London. It has progressed about the same distance towards completion (although it started later), and it is eventually to have a population of about 80,000—the same as Harlow. The present population is about 25,000.

Vällingby is rather nearer to Stockholm than the English new towns are to London—about 10 miles from the centre—so it is not so completely self-contained as regards industry. At present about half the employed population work in Vällingby; the other half travel to Stockholm or elsewhere to work. A small number travel from outside to work in Vällingby. As the town grows the proportion living and working in the town will become considerably higher.

Vällingby is the present terminus of Stockholm's new underground railway (which, like the London underground, emerges above ground when it gets outside the city). At Vällingby the railway runs in a cutting and the main shopping square is over the station, the booking hall forming part of one side of the square, from which stairs descend to the platforms. This square is the main shopping centre for all three of the town neighbourhoods. The two outermost of these incorporate suburban housing established before the new town was planned. The inner neighbourhood—Vällingby proper—is altogether new and will have a population of 23,000.



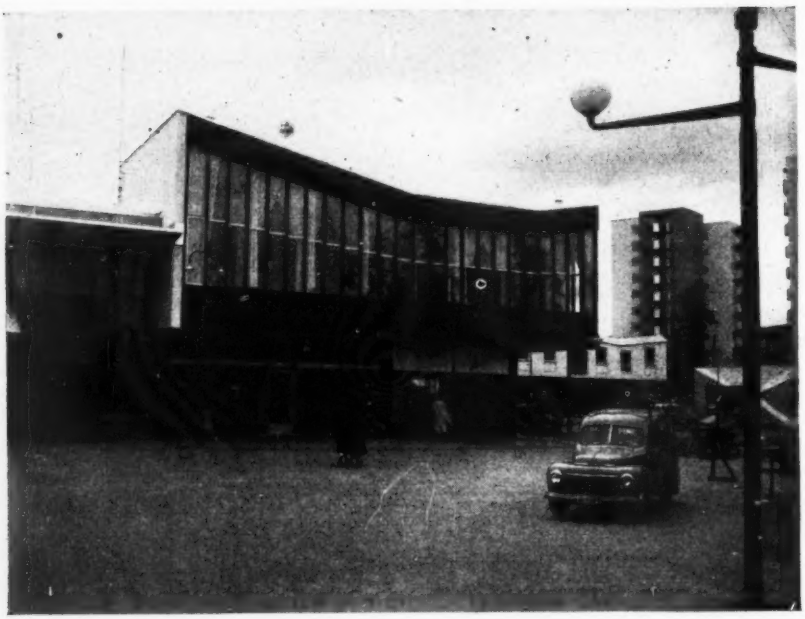
Besides the main town centre there will be neighbourhood centres for every 5,000 people and corner shops for every 700. Unlike the centres of English new towns, the main town centre at Vällingby, which most of these photographs show, is being fully built up in the early stages. The pedestrian shopping square is nearly finished, work is in progress on a library and other public buildings (a theatre, cinema, meeting-hall, etc.) will soon begin. These are placed to the south of the square, beyond which is rocky rising ground with high blocks of flats. Among the blocks will be one reserved for doctors, with a clinic on the ground floor.

Above right: the nearly completed central shopping square. The entrance to the underground railway is beneath the canopy on the left.



Below, looking across one end of the shopping square. Public buildings will be on the right, surrounded by the high flats on the rising ground beyond.

The opposite side of the square, beyond which the ground falls away, is open. Nearby are more high flats and a large school (already in operation). This and nearby housing areas are reached by pedestrian paths, through green strips, with underpasses where they meet the motor-roads. Planning, however, is generally more compact than in the English new towns.



Above: another part of the square. Above the shops is a restaurant; beyond are 11-storey flats.

with full service including child-care, designed specially for married couples both working; food can be taken in restaurants or served in the flats). Vällingby has a district-heating scheme, providing both heating and hot water, serving all but outlying areas from one central station. Population eventually to be served thus: 45,000.

The master-plan of the new town was made in the Stockholm city-planning office under Sven Markelius, whose work, since he retired from his official post early this year, has been taken over by a group of permanent officials led by the city's architect planner Göran Sidenbladh. Bertil Karlén is the architect in charge of Vällingby. Most of the buildings are being designed by private architects working under the strict control of the city-planning office. The land was bought by the city for future development purposes in 1930 *but only brought within the city boundaries in* 1948.

A NEW TOWN, VÄLLINGBY, NEAR STOCKHOLM continued

The main centre has a skyline designed to be pleasing when seen from upper windows of the high flats close by. There is no green space in the centre as this is where the greatest contrast is wanted to the open country round. The central shops have canopies for shelter, and basements for deliveries and storage which are directly served from the underground railway.

The housing in Vällingby proper mostly takes the form of three-storey flat blocks (some of which have old people's one-room flats on the ground floor) and eleven-storey point blocks. This is the maximum height permitted because of the presence of an airport nearby. About one-third of the blocks are private enterprise. One-family houses predominate nearer the outskirts, where building-plots can be rented on a 40-year lease, renewal thereafter being probable, but not guaranteed in order to facilitate changes in the lay-out plan. One housing area, with a population of 1,000, *consists of "family hotels" (flats*

Below: a group of houses farther out: a co-operative venture designed by four architects (Karlén, Ljungqvist, Höjer and Stack) who occupy four of the 29 identical 7-room houses of which the scheme consists. The picture shows the backs of a couple of the houses, the fronts of which all face on to a hill-top green. On the left, at the foot of the hill, are garages.



SECONDARY SCHOOL

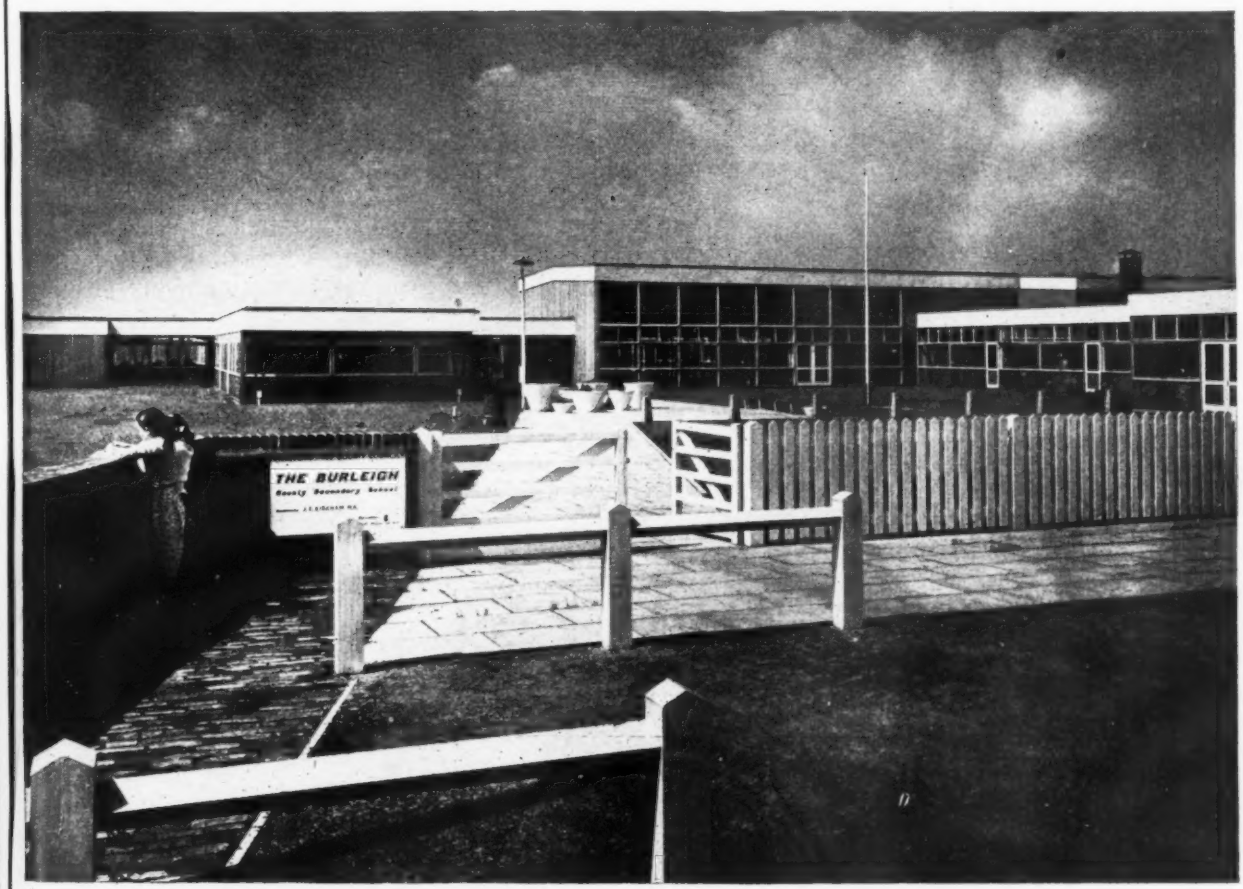
in WELLFIELD ROAD, HATFIELD, HERTS
for the HERTFORDSHIRE COUNTY COUNCIL
designed by ARCHITECTS CO-PARTNERSHIP
in collaboration with C. H. ASLIN, county architect
GARDNER and THEOBALD, quantity surveyors

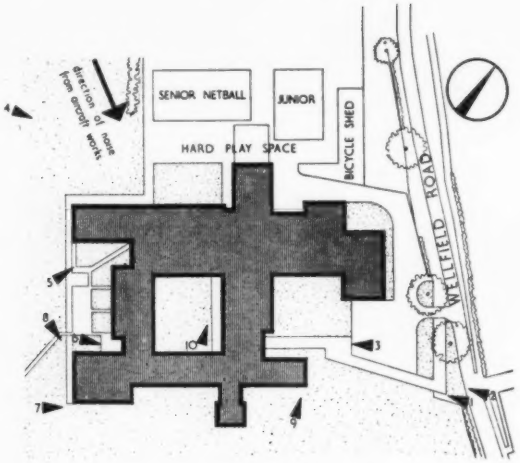


Notice board at entrance, viewpoint 1.

The Burleigh County Secondary School is a three-form-entry secondary modern school situated a few hundred yards from a large jet aircraft factory and landing ground. The noise factor presented a special insulation problem which was successfully resolved by minimum glazing on elevations facing the noise, keeping buildings low, and using lawns as sound-absorbent surfaces. The school, with the exception of the gymnasium, is constructed mainly of pre-fabricated timber components and the general contractors were Welwyn Builders Ltd.; for sub-contractors see page 340.

The school from the east, viewpoint 2





Key plan showing photographic viewpoints



Above, viewpoint 3: At the approach to the main entrance, which forms a link between the assembly hall (on the right) and the staff wing, a group of concrete plant tubs has been used to canalize pedestrian traffic from the wide entrance bay into the narrower path leading up to the entrance doors. The long seat on the right serves a similar purpose. The pitched gable end of the assembly hall is formed by the special deep beams which are also used in the gymnasium. All other roofs are flat. External panels either envelope the V-shaped stanchions, which are staggered centrally within the 3-ft. 4-in. planning grid, as in the assembly hall on the right, or are placed behind the stanchions as seen on the left, in which case there is a minimum roof overhang of 3 ft. 4 in. Below, viewpoint 4: Blank walls face the north-west—the direction of the main source of noise from the jet-engine test beds—and most glazed walls are placed within the " acoustic shadow." The brick block is the gymnasium. The two entrances to the changing-rooms and science laboratories in the foreground are recessed within deep porches. Hard-surfaced areas have, as far as possible, been placed away from the building and grassed areas have been brought close to the walls to absorb sound. Ceiling-heights are mostly kept to 8 ft.

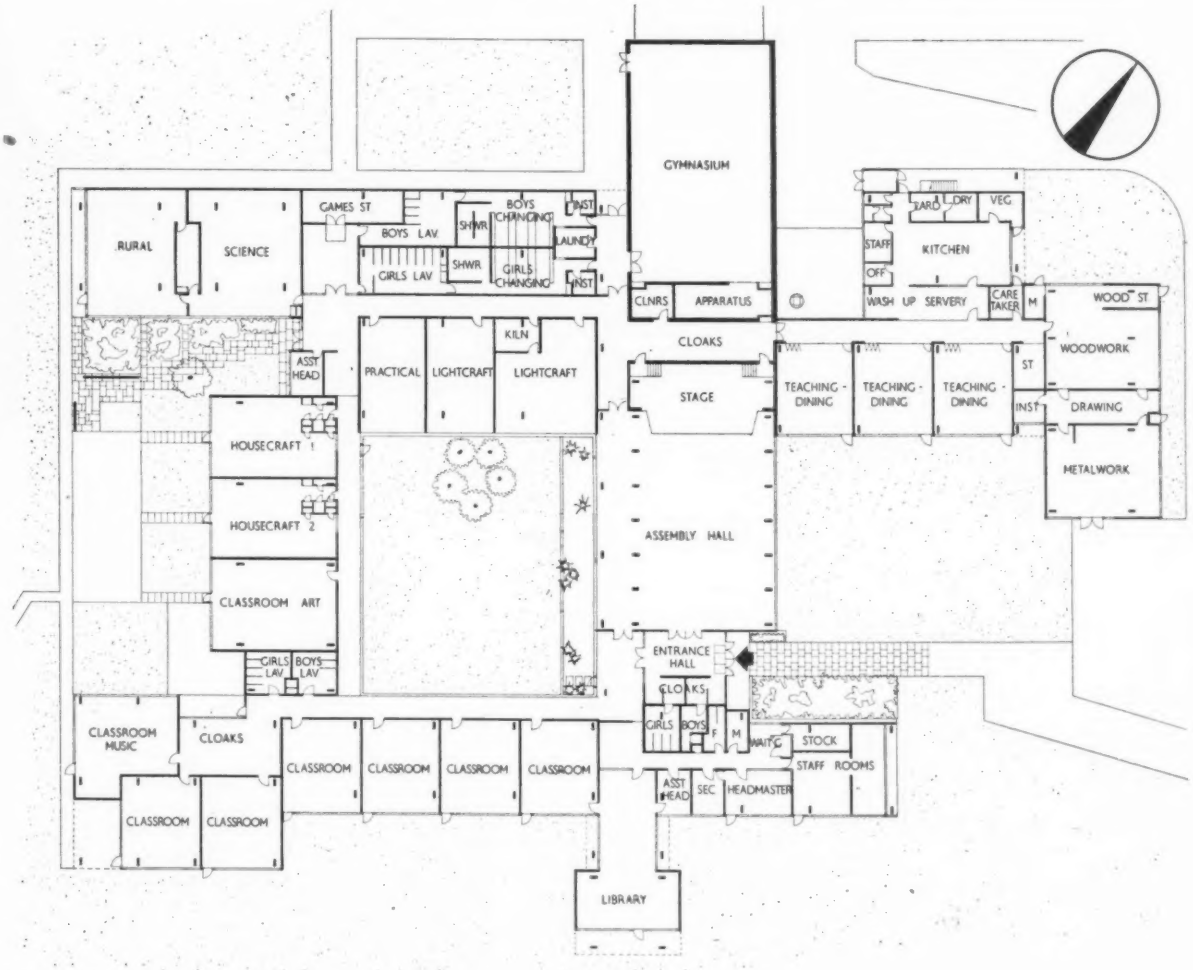




Above, viewpoint 5: continuous windows make up the south-east elevations of the school. Plywood has been used for the deep white-painted fascia and also for the varnished panels below the aluminium sliding-sashes. A secondary entrance can be seen between the science block (left) and the house-craft block. The plots on either side of the path will be planted and maintained in connection with the rural science course when it is established. Right, viewpoint, 6: this entrance to the main classroom block shows the adaptability of the structural system used in the formation of external and internal corners both on the perimeter line of the roof and inset within it. A brick-on-edge drip plinth which has been laid around the school forms a neat transition from wall panels to ground.

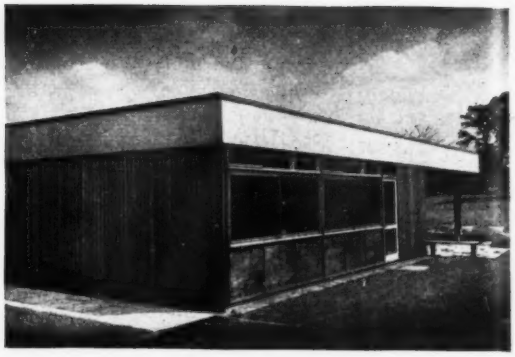


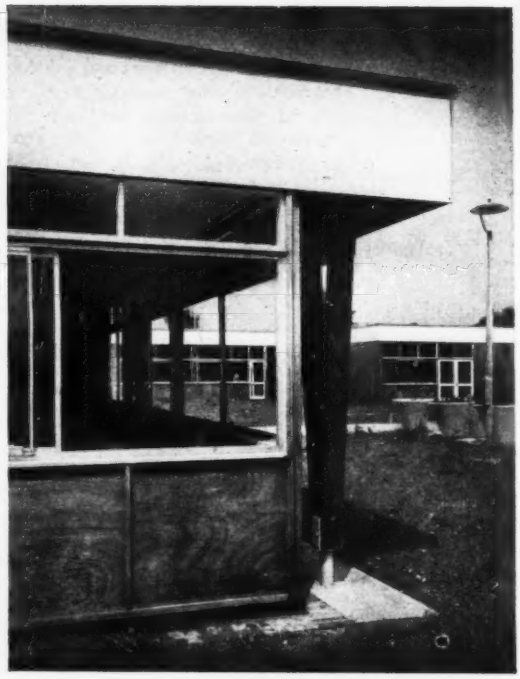
SECONDARY SCHOOL AT HATFIELD



Ground floor plan

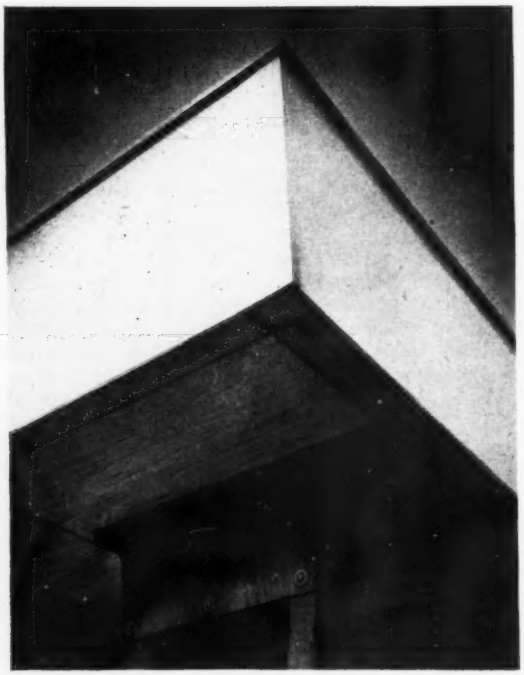






Above left, viewpoint 7: a further example of external covered-space possible in the structural system of free standing stanchions. (See detail drawing on page 330). The soffit is 3-ft. 4-in. square plywood panels. Above right: the vertical weather-boarded external walls are assembled from a small range of standard pre-fabricated timber panels consisting of stud-frames with an inner lining of plywood and an interleaf of ¾-in. glass wool to form a double cavity (see detail drawing). Centre right, viewpoint 9: windows are aluminium, horizontal double-sliding sashes. They have ventilating-hoppers and fixed-lights above the transoms. These units arrived on the site fixed in their wooden sub-frames and ready-glazed. The pre-cast concrete lamp-standard is of a type in general use by the Hatfield Development Corporation. Below left: a detail of the welded-steel shoe which forms the base of the stanchion. The short tube is welded at the bottom to a flat plate and secured by holding-down bolts to the foundation. Below right: a detail of the plywood stanchion-head gussets which continue up into the roof space to form connections for the primary beams and cantilevers.



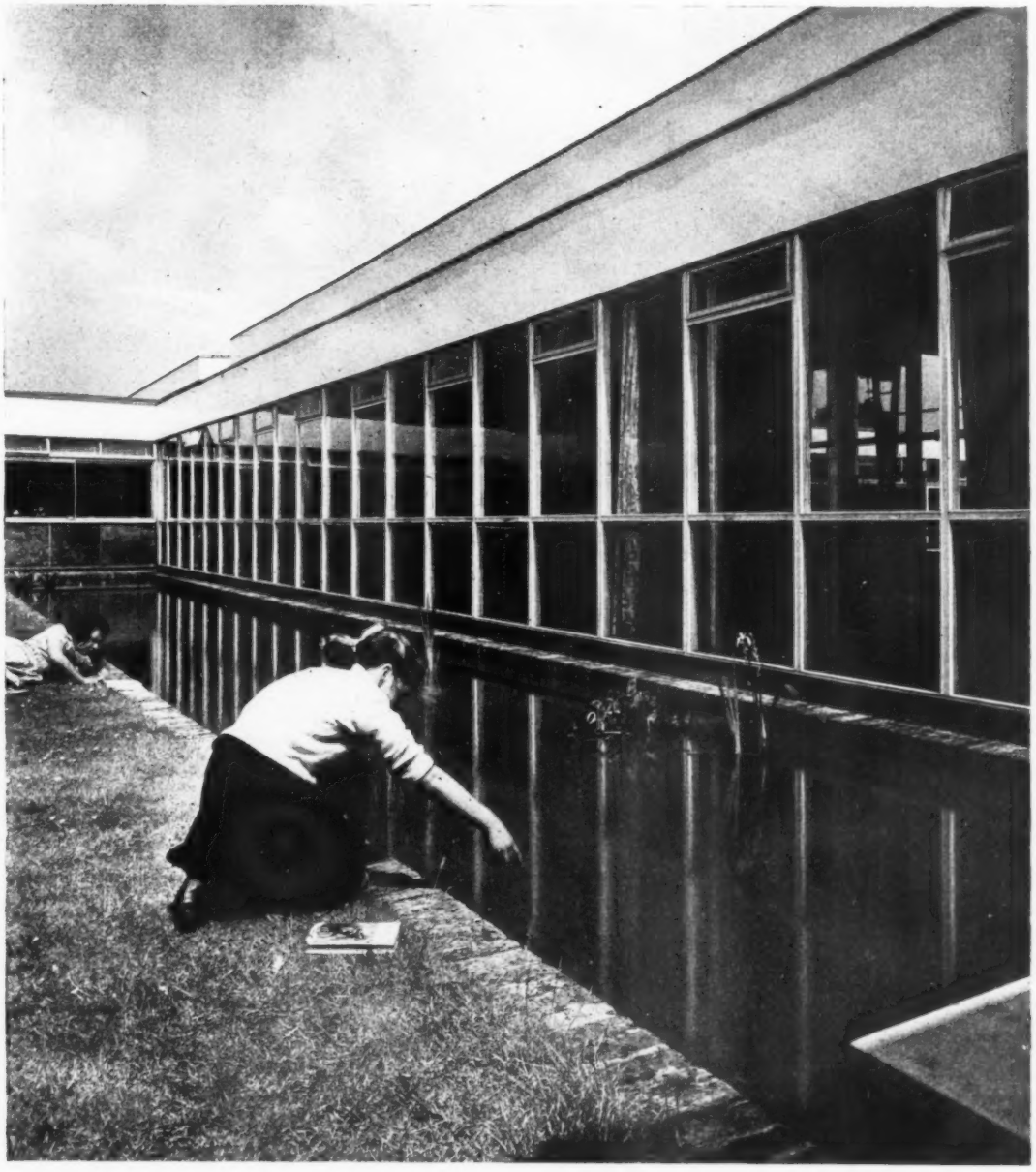


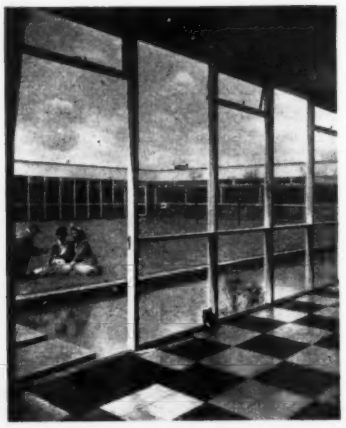


Left: the external corner junction between a solid panel and a window panel is formed with a corner plate and post (see detail drawing on page 331).

SECONDARY SCHOOL AT HATFIELD

Below, viewpoint 10: the internal courtyard is a lawn, with the exception of a biology pond along the full length of the assembly hall. The pond was sited to catch the rays of the sun and reflect them upward on the surface of the low ceiling of the hall. The brick-on-edge drip plinth has been returned round the pond to form a margin between the lawn and the water.

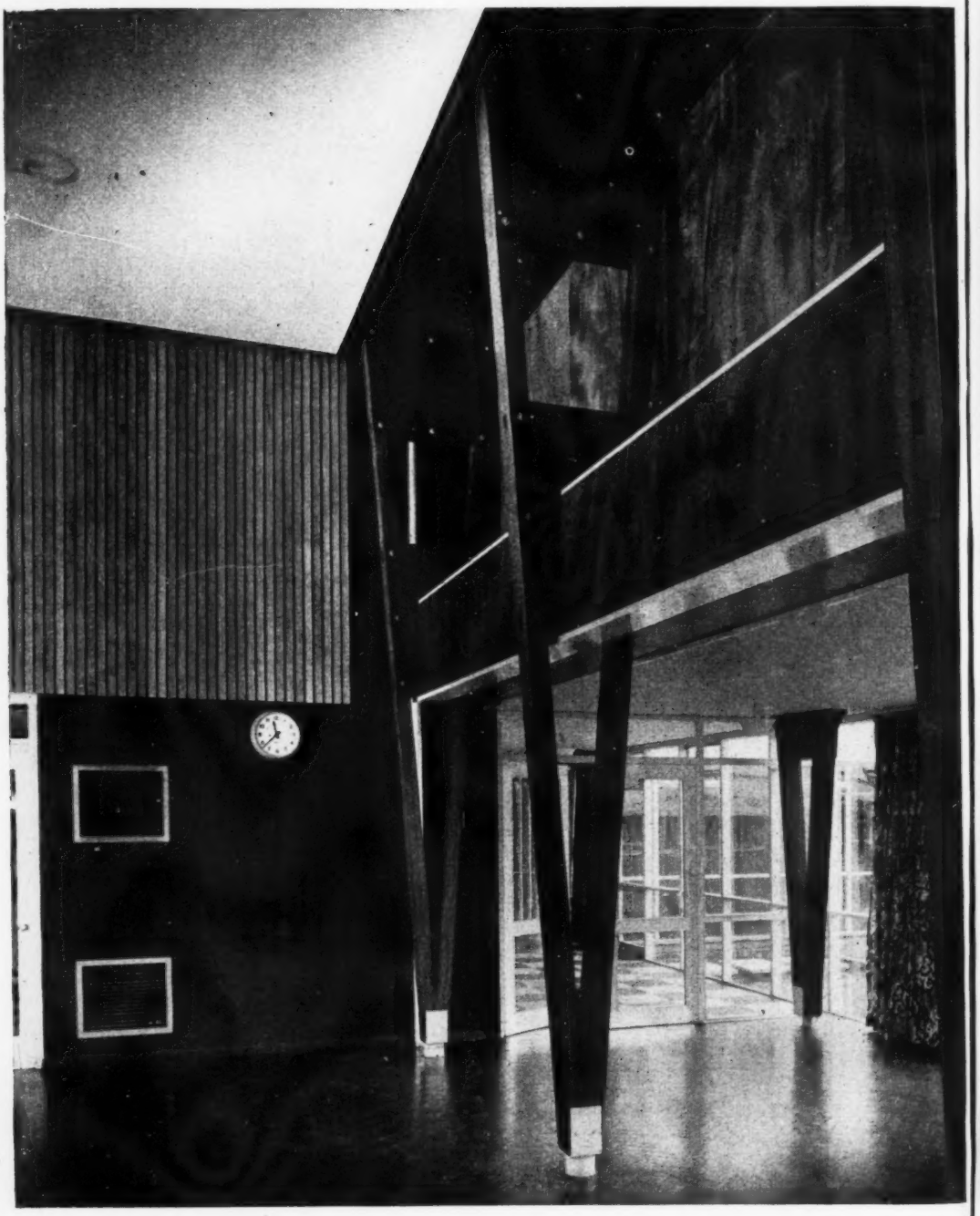


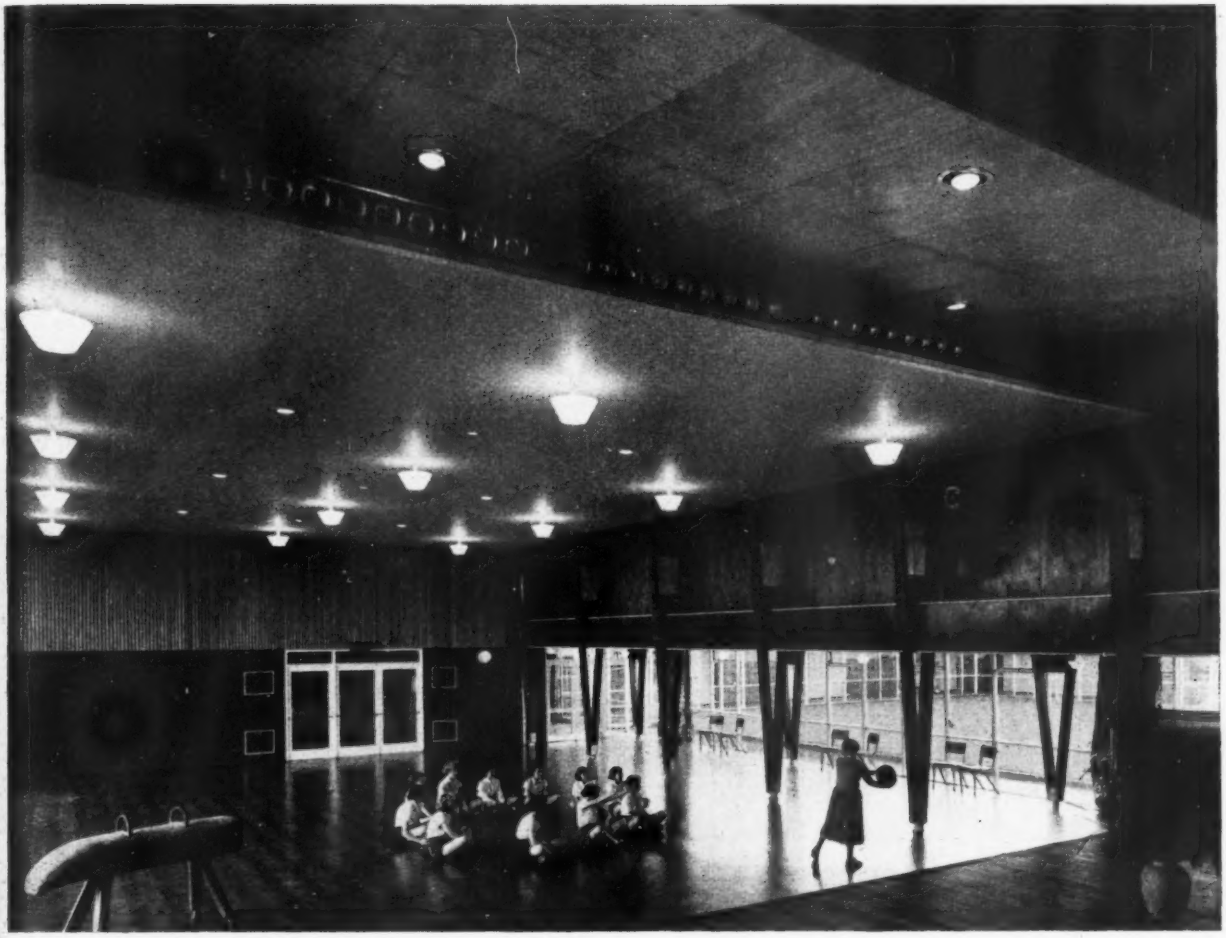


Left: from the hall; the biology pool in the foreground. On two sides the courtyard is enclosed by corridors glazed to floor level. The corridor on the south-east side serves the general classrooms and on the south-west it passes the art room and two housecraft rooms.

SECONDARY SCHOOL AT HATFIELD

Below: open-jointed hardwood slats, with a backing of glass wool, have been used to provide sound absorption on the end wall of the assembly hall. Changes of level between adjacent ceilings on either side of a single row of stanchions are not provided for by this system of construction and the V-shaped stanchions require special connections. This accounts for the encased beam slung between the stanchions on the right of the hall where it opens on to the corridor. Between the end stanchion and the wall is an aluminium rain-water down pipe.



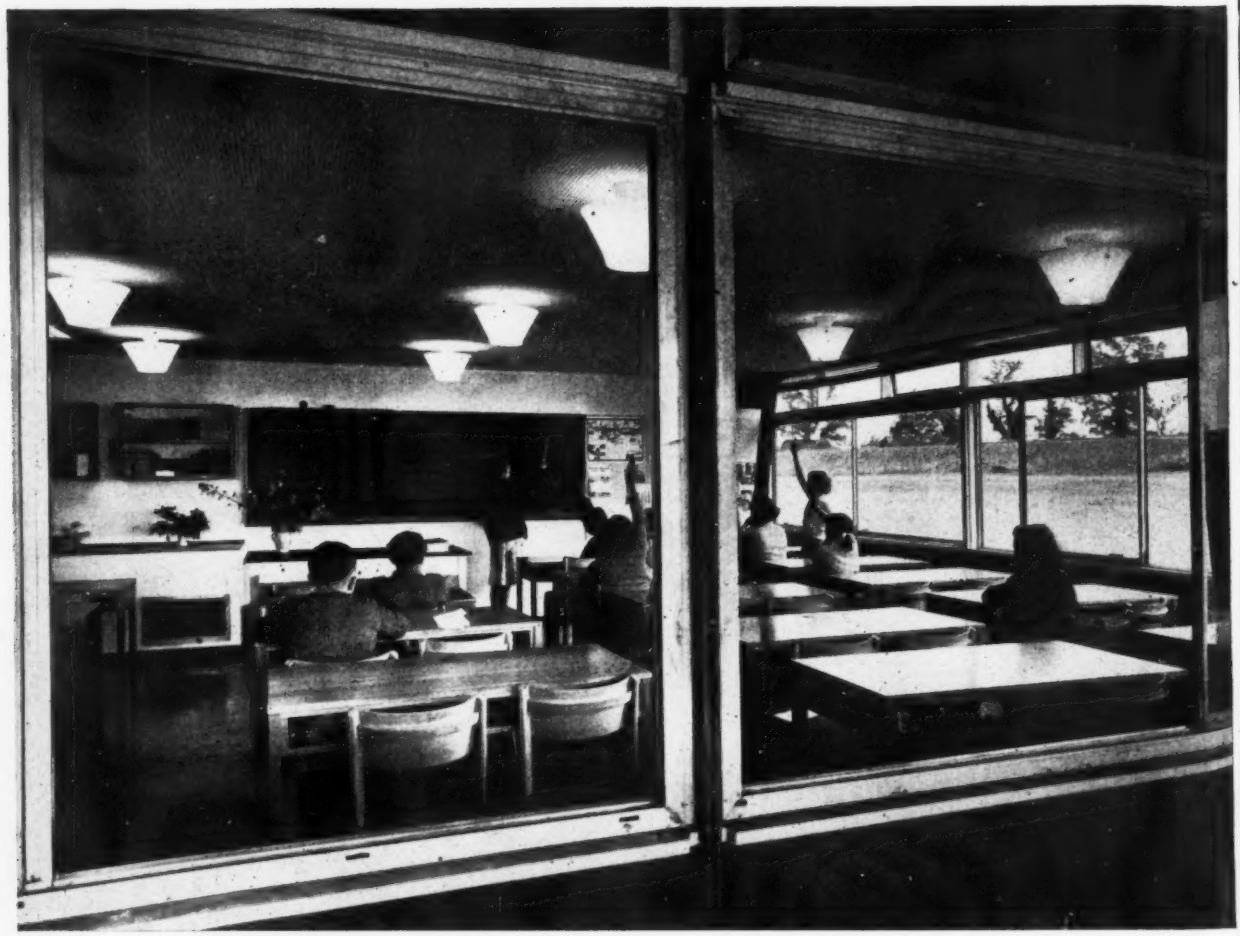


Above: the assembly hall forms one side of the central courtyard. The stage is 3 ft. 6 in. above floor level and the backstage area behind the curtains is used as a projection room. The lighting of the assembly hall is designed to give a good general diffusion and downward component with an element of lively sparkle provided by the flush-mounted louvred reflectors. Below left: one end of the entrance hall is planned as a periodicals room en suite with the library through the glazed screen beyond. Below right: a pottery display cabinet in the main entrance.









Opposite page, top: the library, which is T-shaped on plan, has a long veranda on the south side covered by a 6-ft. 8-in. roof projection. The room is planned in conjunction with an English classroom, seen through the window on the left. Opposite page, bottom: a general classroom. Ceiling heights are 8 ft. throughout the school and perforated-plasterboard ceiling panels 3 ft. 4 in. square are fixed directly to the undersides of the timber beams.



SECONDARY SCHOOL AT HATFIELD

Right: three classrooms, which are used also for dining, are separated from the kitchen by a corridor: this provides circulation to and from the serving hatches. These rooms have sliding-folding partitions which allow them to be opened out to the corridor. The positions of tables for dining are marked by white insets in the floor tiles. Below left: the kitchen corridor leads to the heavy-crafts wing which contains woodwork and metalwork rooms, a drawing office and an instructor's room. This picture shows the woodwork room with its timber store, easily accessible from the work area. Below right: a general view of the metal work room with the door on the left to the drawing office which can be entered also from the woodwork room on the other side. The drawing office is also used as a general practical space. Bottom left: one of two light craft rooms, the larger of which is fully equipped for pottery. Bottom right: one of the two house-craft rooms with the glazed corridor and courtyard beyond.















Above left: the heater units of the re-circulated warmed air system are housed in horizontal cabinets which also provide useful bench tops. Above right: a neat and robust cloakroom fitting designed by the architects provides storage below the hardwood seats and allows plenty of room for cleaning underneath. Left: the gymnasium is a brick structure with deep beams supported on piers. The aluminium roof decking is left exposed and painted on the underside. The deep beams, boxed in with plywood, provide an excellent cut-off to the roof lights which the wide-angle lens of the camera tends to belie. The gymnasium is top lighted with the exception of a glazed door out to the playground. Below left: the permanent ventilation of the gymnasium is provided by a grille under the eaves fascia running the full length of each long wall. Sound absorption is provided along the top half of each end wall by vertical hardwood slats and a backing of glass wool.



CLIENT'S BRIEF: his stated requirements

A three-form entry secondary modern school for 450 boys and girls between the ages of 11 and 15 years. No special education emphasis was asked for but it was suggested that the assembly hall should be a focus for the whole school and that the library should form a secondary focus, linked with centrally-placed academic classrooms whose work would be based on the library. The practical rooms to be planned on the periphery. The schedule of accommodation was laid down by MOE. Three classrooms to be used also for dining, accommodating about 80 per cent. of the school in two sittings. All specialist rooms were planned in collaboration with the specialists in the county education office and based on the county user requirement documents, the compilation and use of which was described in the analysis of the county council school at Barnet Lane, published in the JOURNAL on February 24, 1955.

SITE: topography, surroundings, access, planting

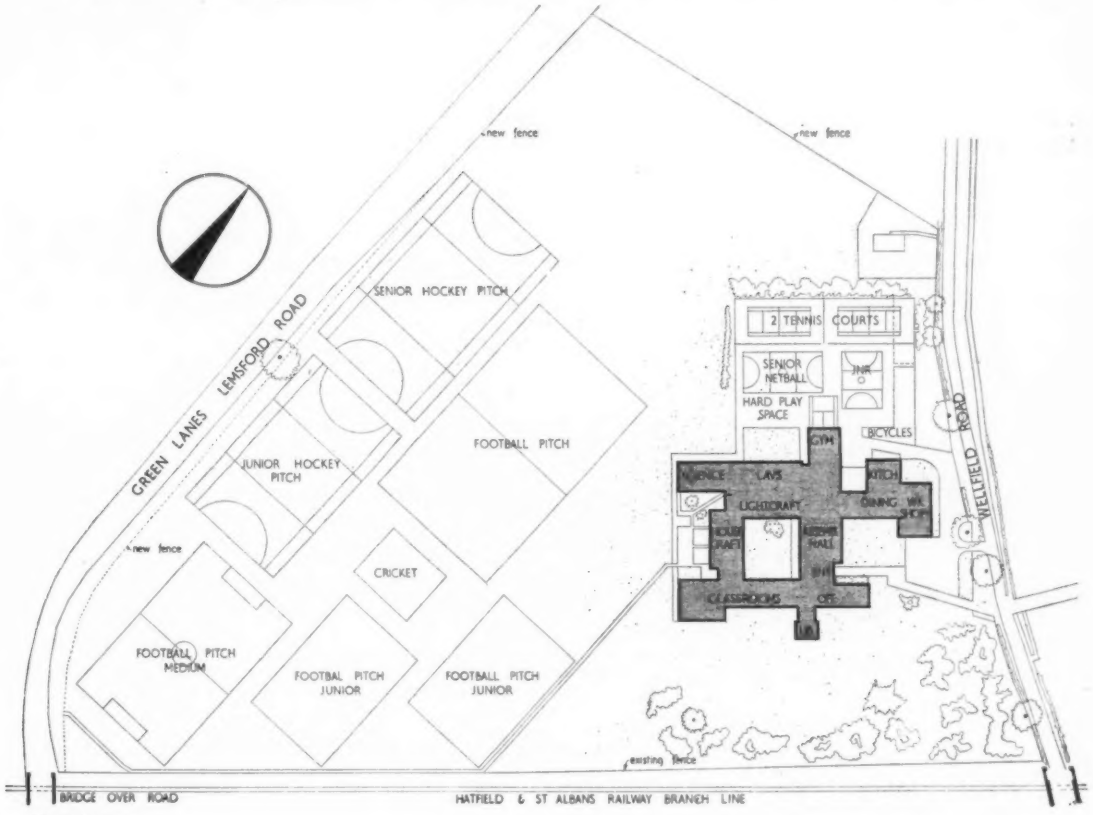
The ground slopes slightly down from south-east to north-west, but for planning has been treated as virtually flat. A seldom-used railway runs along the south-east boundary on a high embankment which excludes any distant outlook in that direction. Wellfield Road, linking Hatfield New Town with the Great North Road, forms the north-east boundary and gives main access to the school. There is a subsidiary path access for children along the south-east boundary of the site from Lemsford Road.

On the far side of the Great North Road, and within a few hundred yards of the school, there is a large aircraft factory where jet engines are tested. The general principles for keeping the noise nuisance from this testing down to a minimum were discussed with BRS and have influenced the siting, planning and detailing to a considerable extent. There were a number of trees on the north-east part of the site, nearly all of which were diseased elms which had to be cut down. Two tennis courts have been provided as a part of the statutory "hard area." The rural science section will use about 1¼ acres adjacent to the hard play space as a garden, in addition to the small area adjacent to the domestic science and science rooms.

All existing hedges have been retained, and new fencing will ultimately give way to new hedge planting where necessary. The pool in the courtyard, which can be used for biology lessons, is designed to reflect the sun on to the low ceiling of the assembly hall.

The detailed planting scheme, some of which has already been carried out, was designed in consultation with the Education Department.

The site, which is sixteen acres in area, was bought for a school before 1939. The housing area served by the school lies to the north and east.



Site plan

PLAN: general appreciation

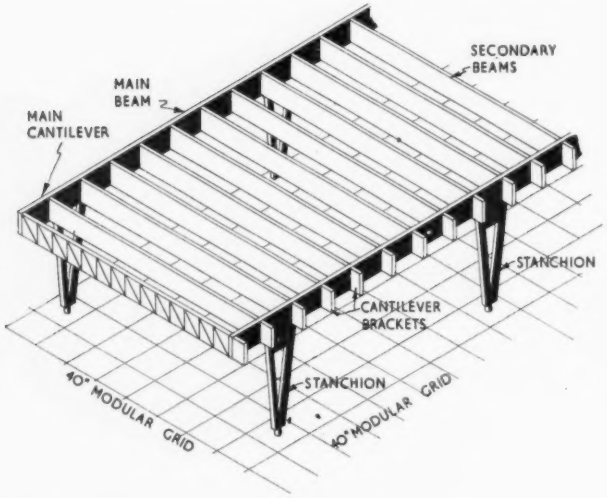
The building is sited towards the south-east corner of the land near to Wellfield Road. It is a single-storey building planned round a central courtyard with various practical and other specialist rooms in projecting wings from the main body of the building, each of which has cloakrooms and lavatories related to it. One lot of cloakrooms and lavatories is accessible to the hard play space and can be used during out-of-school hours when the rest of the school is shut. The main users of domestic hot water—the kitchen and the changing rooms—are placed near the boilerhouse; there is a supplementary gas boiler adjacent to the domestic science rooms. The woodwork and metalwork rooms have access to the entrance road for delivery of materials; this road serves the kitchen and boiler-house, and links with the hard play-space, which can be used as a supplementary car park. The school is planned around a central court-yard in order to give as much feeling of compactness and unity as possible to a small single-storey building. The building is as far from the aircraft works as is possible, and as few windows as is practicable face the noisy airfield: this has led to the use of rather more top lighting than is normal. All parts of the school are kept as low as they reasonably can be, and the majority of rooms look out on to grassed and planted areas which are placed to act as sound absorbers.

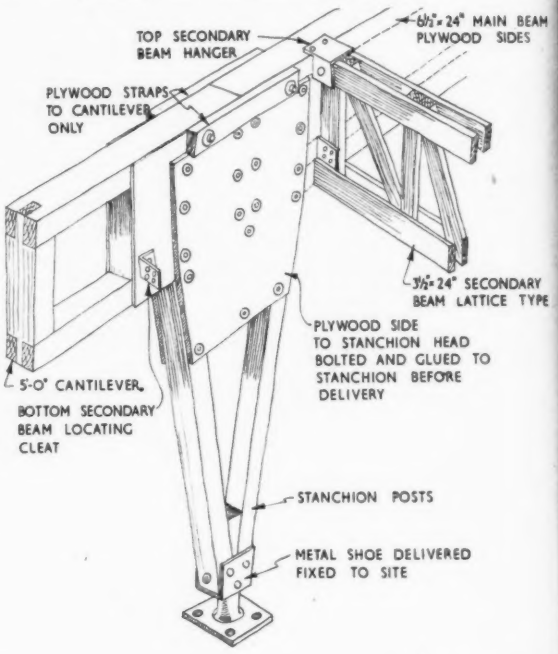
MAIN CONSTRUCTION: general appreciation

The school was first planned on an 8-ft. 3-in. grid, using a light steel frame construction, but, after Education Committee approval, a national steel shortage threatened to postpone the start of the building beyond the 1952 programme, and a design for a timber frame was prepared.

The frame was designed for use on this and three other schools to enable the original building programme to go ahead. The adaptation from steel to timber and from an 8-ft. 3-in. to 3-ft. 4-in. module proved possible without any fundamental change to the plan. The frame consists only of the columns and beams. The external wall, windows, and internal wall design were prepared for this building only.

It was designed as a substitute for, and to be interchangeable with, the then current Hills 3-ft. 4-in. HCC frame, where the steel columns were central off the grid with 3-ft. 4-in. square mushroom heads taking the beams.





Above: general arrangement of timber beams
Right: stanchion and beam connection

MAIN CONSTRUCTION

Load-bearing element	*Location*	*Beam spans*	*Column grid*	*Comments and reasons*
Hardwood V-shaped columns. Lattice timber-ply-faced main beams. Open-lattice timber secondary beams fixed to main beams with metal shoes	Columns occur centrally off grid in both directions; perimeter and partition walls run either outside or inside columns on grid line.	Main beams span 10 ft. to 30 ft. in units of 3 ft. 4 in. Secondary beams span 6 ft. 8 in. to 23 ft. 4 in. in units of 3 ft. 4 in.	Columns spaced from 10 ft. to 30 ft. according to required spans in modules of 3 ft. 4 in.	Columns V-shaped for wind bracing and to provide "pin" joint at base giving ease of erection on site. Placed off module to allow for modular panel wall systems to have constant panel width without specials at column junctions
13½-in. brick walls with piers supporting timber main beams	Related to grid but located to suit special beams of 41-ft. 6-in. span at 10-ft. centres in gymnasium	Special pitched main beams for assembly hall and gym. span 40 ft. and 41 ft. 6 in. respectively Cantilevers 8 ft. 4 in., 5 ft. or 1 ft. 8 in. to main beams. 5 ft. or 1 ft. 8 in. brackets to secondaries		Main beams ply-faced for maximum strength. Secondary beams open-lattice girders for economy

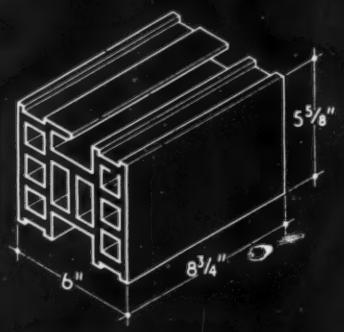
Foundation type	*Location*	*Sub-soil*	*Depth*
Concrete pads	Under columns	Clay ballast. Bearing capacity 2 tons/sq. ft.	Generally 1 ft. 6 in. below ground, but edge beams deepened to 2 ft. 6 in. to take fill where necessary
Reinforced edge beams	Perimeter of slab		
Site slab part reinforced	Under partitions and on built-up ground		

Outer wall type	*Location*	*Materials*	*Finish*	*Reasons*
Vertical weather boarding	Solid walls	Western red cedar	Natural untreated	Good weathering quality; virtually no maintenance
Glass and panel filled sub-frames (see AJ Working Detail, Windows, No. 26, 15.7.1954)	All window areas	Aluminium-framed windows and resin-impregnated ply panels in softwood sub-frames	Ply-varnished softwood, painted	Windows of large opening area delivered to site ready-glazed for quick erection into shop-made wooden frames
Load-bearing	Gymnasium	Brick, sand-faced red externally; sand-lime grey internally	Fairface	Maintenance-free load-bearing wall required

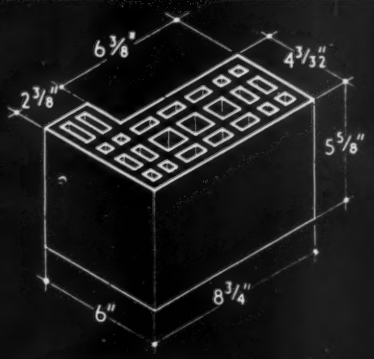
Architects' Journal 8.9.55

BUILDING BLOCKS | HOLLOW CLAY | GENERAL DATA

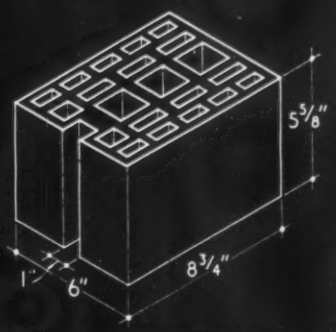
The Architects' Journal Library of Information Sheets 535. Editor: Cotterell Butler, A.R.I.B.A.



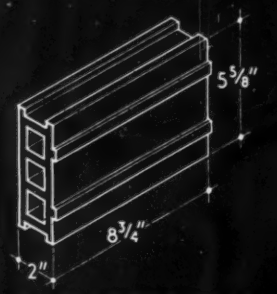
STRETCHER BLOCK.



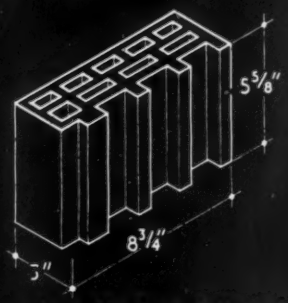
CORNER BLOCK.



FULL JAMB AND CLOSER.

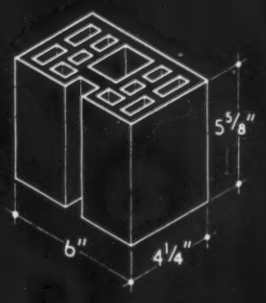


cut on site from stretcher block

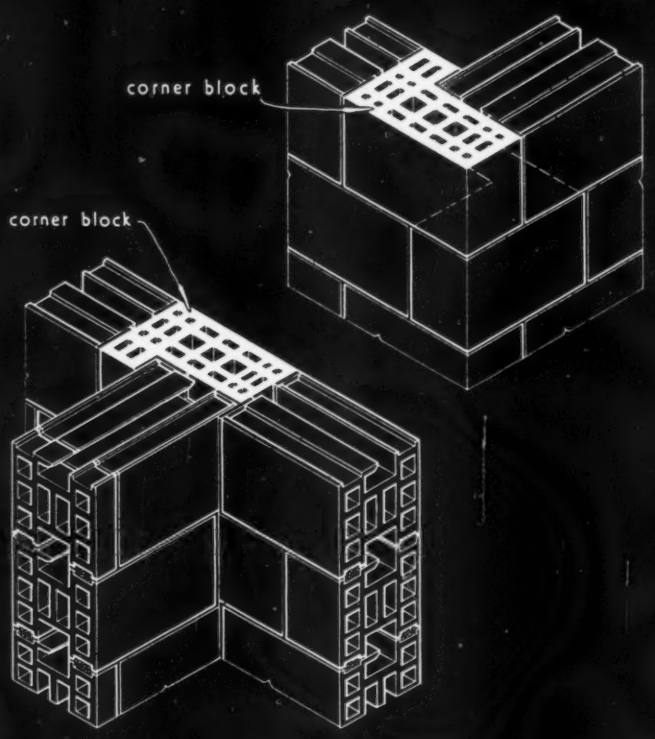


cut on site from full jamb

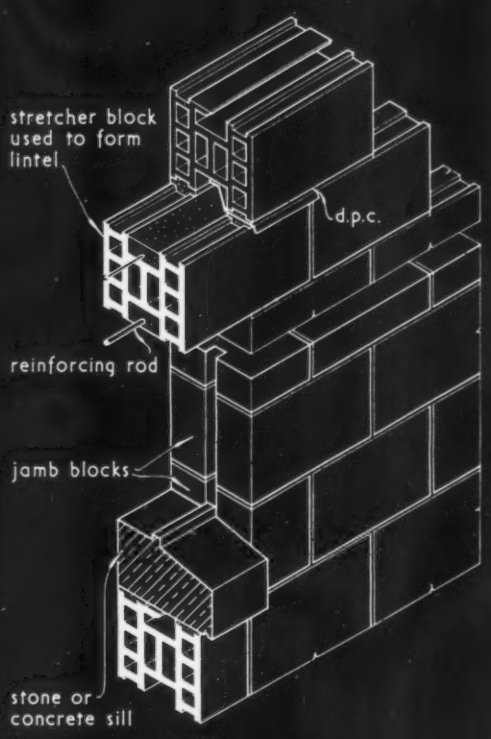
CUT CLOSERS.



HALF JAMB AND CLOSER.



TYPICAL APPLICATIONS OF CORNER BLOCKS.



DETAIL OF WINDOW OPENING.

·PHORPRES· HOLLOW CLAY BLOCKS FOR WALLS Manufacturers : London Brick Company Limited

14.B2 ·PHORPRES· HOLLOW CLAY BLOCKS FOR WALLS

This Sheet supersedes Sheet 14.B2 published 10.6.54, and describes Phorpres hollow blocks for walls. Sheet 14.B1 deals with Phorpres blocks for walls and partitions and Sheet 14.B3 with floor blocks.

Material

Phorpres building blocks are manufactured as described on Sheet 14.B1.

Design and Construction

Phorpres building blocks are designed strictly for the purpose to which they are to be applied. Every wall and web of its multi-cellular construction serves its purpose in securing the maximum strength of the unit with minimum weight. It will be noted that lintels may be formed for all types of opening by introducing reinforcement rods into the voids of the units and then filling with concrete, as shown in the drawing on the lower face of the Sheet.

Sizes and Weights of Building Blocks

Size	Wt. of blocks (lb. per sq. yd.)*		Yards per ton	
	Gault	Weald	Gault	Weald
8½ in. × 5½ in. × 6 in.	226	258	10	8¾

* 24 blocks per sq. yd.

Crushing Strength

The average crushing strength of individual blocks (calculated on the gross area of the block) is 1,400 lb./sq. in. Routine tests by the Technical and Research Laboratories, London Brick Company Limited.

Strength of Walls

For the purposes of test, wall panels 8 ft. high × 4 ft. 6 in. wide × 6 in. thickness were built in 1 : 1 : 6 cement/lime/sand mortar. When crushed with a concentric loading the failing load was 94 tons and with eccentric loading 47 tons. (Strain and deflection readings on both sides of the panel were recorded.)

Thermal Transmittance

The thermal conductance was measured on a 3-ft. square panel both faces of which had been treated with a skimming coat of neat hemi-hydrate plaster. The thermal conductance was 0·50 B.Th.U. per sq. ft. per hour for 1° F. difference in temperature between faces. Making the usual allowances for surface resistance, this indicates air to air transmittance of 0·33 B.Th.U. per sq. ft. per hour for 1° F. difference in air temperature. This is slightly higher than the value (0·30) for an unventilated 11-in. cavity wall which is now regarded (see Housing Manual 1944, p. 96) as the maximum for houses and flats. The introduction of an additional cavity, as for example by plastering on lathing over battens fixed to the wall, would bring the transmittance down to a satisfactory value.
It is concluded that the Phorpres block will give a wall slightly inferior to an 11-in. cavity wall but superior to a 9-in. solid wall in heat insulation. Tests by Building Research Station (D.S.I.R.). Since these tests were made there has been a slight modification to the internal design of the block.

Thermal Insulation

The enclosed dead air spaces provide positive insulation against rapid changes in temperature. The " twin wall " or " double shell " design of the block, with its non-continuous mortar joints, together with the moisture stops at each end, acts as an additional barrier against the passage of cold, heat and moisture. Thus Phorpres building block construction gives balanced temperature conditions in winter and summer.

Sound Insulation

The sound insulation qualities of Phorpres building blocks are superior to most light-weight forms of construction. It is generally accepted that resistance to airborne sound is directly proportional to the mass per unit area of the wall, as the denser the body the greater its resistance to airborne sound.

Fire Resistance

Made of a raw material, clay, which is absolutely non-inflammable and exposed during the process of manufacture to 980° C., the blocks have been proved by test results to be fire-resisting beyond the spalling point of reinforced concrete. When heated to a temperature of 650° C. (1,200° F.) and plunged into water, the block does not disintegrate.

Moisture Penetration

The building block has been designed to provide in one skin all the advantages of cavity wall construction. There can be no capillary attraction through the mortar joints as they are not continuous.
An unrendered panel 8 ft. high × 4 ft. wide × 6 in. thick was tested for resistance to rain penetration. It is considered that the Phorpres block provides a wall that is superior to an unrendered 9-in. brick wall in resistance to rain penetration (this standard is now regarded as a low one) and should normally give a dry interior, though dampness will sometimes appear after exposure to rainstorms of unusual severity. Tests by Building Research Station (D.S.I.R.). Since these tests were made there has been a slight modification to the internal design of the block.

Applications

A wall comparing favourably in performance to contemporary types of cavity construction can be laid in one operation. The size of the blocks and the ease with which they may be handled reduces the amount of scaffolding required to a minimum. As the units are designed to suit brick dimensions, bricks can be used at any point in the construction to line and bond with the blocks. The blocks can be readily cut where special closers are required. The special units which are available are required only at corners and openings and may be applied to any design. First floor joists and roof timbers are provided with a bearing without the necessity for cutting the block.

Laying Instructions

The general practice is to lay Phorpres hollow blocks in 1 : 1 : 6 cement/lime/sand. This mix can, of course, be varied to suit particular conditions but too rich a mortar and thick joints should be avoided. Care should be taken to avoid bridging the gap between the two horizontal joints. The amount of water in the mix is reduced to a minimum owing to the texture of the material.

Finish

The standard block is faced on one side and keyed on the other. The external facing, which can be rendered if required, is known as " rug-face." Should the blocks be required smooth-faced, this can be arranged provided sufficient notice is given at the time of ordering.

This Series of Sheets on bricks and blocks covers general data on, and applications of, common, facing, cellular and keyed bricks, hollow walling, partition and floor blocks.

Compiled from information supplied by:

London Brick Company Limited
Head Office: Africa House, Kingsway, London, W.C.2.
Telephone: Holborn 8282.
Telegrams: Phorpres, Westcent, London.

Midland District
Office: Prudential Buildings, St. Philip's Place, Birmingham, 3.
Telephone: Colmore 4141.

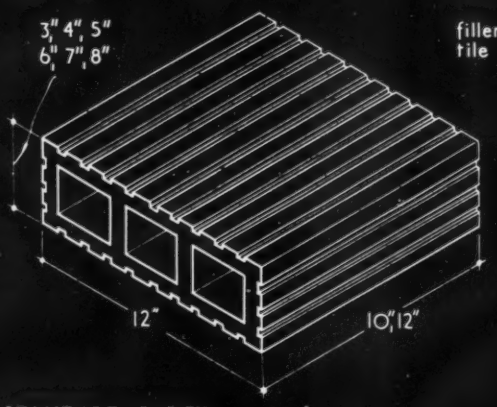
South Western
District Office: 11, Orchard Street, Bristol, 1.
Telephone: Bristol 23004/5.

Northern
District Office: St. Paul's House, St. Paul's St., Leeds, 1.
Telephone: Leeds 20771.

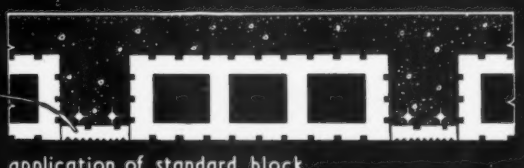
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BUILDING BLOCKS | HOLLOW CLAY | GENERAL DATA

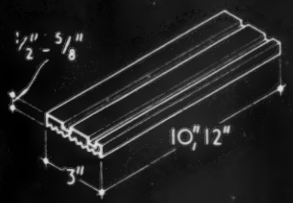
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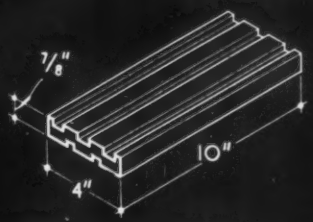
STANDARD BLOCK.



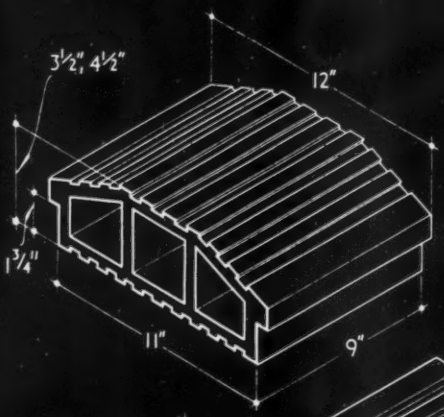
application of standard block

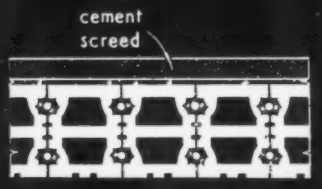


FILLER TILE.

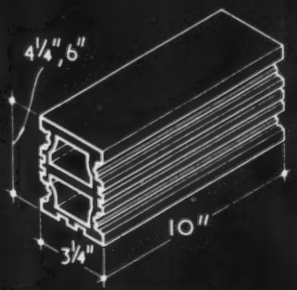


PANEL HEATING TILE.

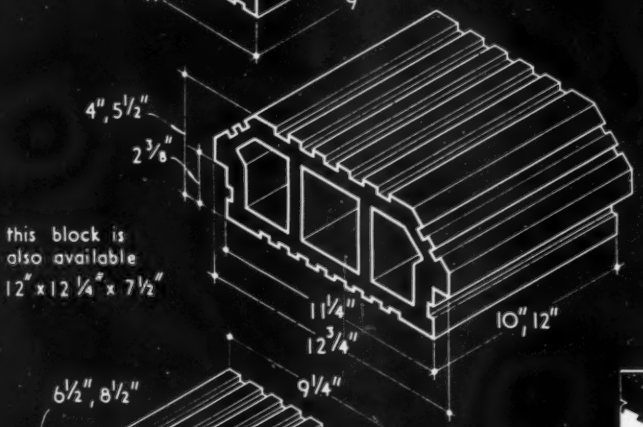


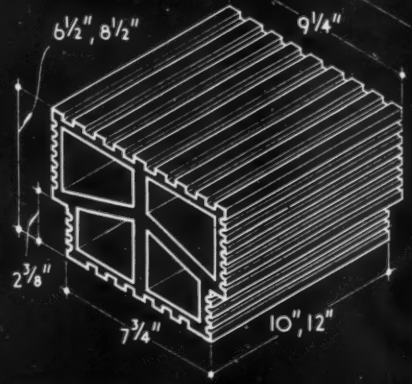


application of clay block unit

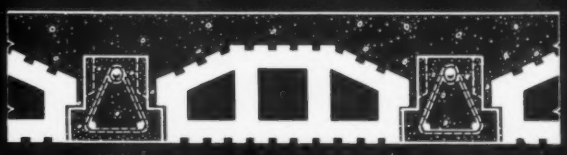


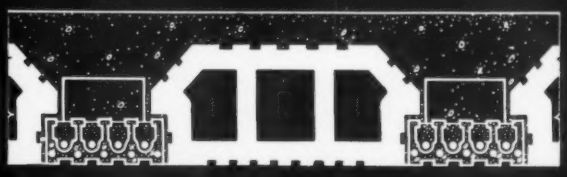
CLAY BLOCK UNIT.





LIPPED BLOCKS.





application of lipped blocks

·PHORPRES· HOLLOW CLAY BLOCKS FOR FLOORS.

14.B3 'PHORPRES' HOLLOW CLAY BLOCKS FOR FLOORS

This Sheet supersedes Sheet 14.B3 published 24.6.54, and describes Phorpres hollow blocks for floors. Sheet 14.B1 deals with Phorpres blocks for walls and partitions and Sheet 14.B2 with walls.

Materials

Phorpres floor blocks are manufactured from gault (buff in colour) and also weald clay (terra cotta in colour), the latter being a high quality engineering clay.
The clays are extensively tempered and extruded into hollow blocks which are then entirely mechanically handled throughout a strictly controlled drying and burning process. The clays are generally free from injurious particles of lime or salts and the burning process renders the material entirely inert, minimising the occurrence of shrinkage or cracking in the finished plastered surface. The finished product is uniform in size and shape and free from excessive winding and bowing (see B.S. 1190 : 1951 for tolerances) ensuring minimum laying and plastering costs.

Design and Construction

Three types of block are illustrated on the face of the Sheet: the standard block for use in in-situ floors with filler and panel heating tiles as shown in the drawing; the lipped type for use with prestressed or precast beam construction and the clay block unit for hollow-tile beam construction.

Key for plaster: The bond or physical adhesion of a rendering or plaster is dependent upon the inherent porosity of the backing material, and in this respect Phorpres blocks possess a balanced absorption or suction value. This is further assisted by the mechanical keying provided by grooves of dovetail form. This mechanical key is of first importance in the early stages of drying and setting, when cracking may result from the vibration inevitable during construction. This vibration may also otherwise interfere with, or even prevent, the development of the necessary physical adhesion.

Sizes and Weights of Floor Blocks

Type of Block	Size	Weight of blocks (Tons per 1,000)	
		Gault	Weald
Floor Blocks (For in-situ hollow tile floors and roofs)	10" × 12" × 3"	—	5·0
	10" × 12" × 4"	—	6·3
	10" × 12" × 5"	—	6·5
	12" × 12" × 3"	5·85	—
	12" × 12" × 4"	6·3	—
	12" × 12" × 5"	7·55	—
	12" × 12" × 6"	8·4	—
	12" × 12" × 7"	10·45	—
	12" × 12" × 8"	12·3	—
Filler Tiles (For concrete ribs)	10" × 3" × ½"	—	5·0*
	12" × 3" × ½"	5·0*	—
Panel Heating Tiles	10" × 4" × ½"	—	10·25*
Lipped Floor Blocks (For prestressed and concrete beam floors)	9" × 12" × 3½"	—	5·2
	10" × 12½" × 4"	—	5·5
	9" × 12" × 4½"	—	5·5
	10" × 12½" × 5½"	—	5·75
	10" × 9½" × 6½"	6·2	—
	12" × 12½" × 7½"	10·25	—
	12" × 9½" × 8½"	9·0	—
Clay Block Units (For prefabricated hollow tile floors)	10" × 3½" × 4½"	—	2·3
	10" × 3½" × 6"	—	3·0

* Weight per 10,000 tiles.

Crushing Strength

Average crushing strengths of individual blocks tested on flat.

Type of block	Crushing strength (lb./sq. inch)
10" × 12" × 4"	3,200 (B.S. requires 2,500)
12" × 12" × 3"	3,250 (" " 2,500)
12" × 12" × 5"	3,150 (" " 2,500)

From routine crushing strength tests by the Technical and Research Laboratories, London Brick Company Limited.

Thermal Resistance

The transfer of heat from the air on the warm side of a floor or roof to the air on the cooler side is determined by the difference in air temperatures, number of air spaces, type and amount of construction materials, direction of heat flow and by the character of the surfaces.
The heat transmission coefficient (obtained for floors and roofs by tests on composite sections as for walling), allowing for a 4-in. floor block plus 2-in. concrete topping with plastered ceiling, is as follows :—

Overall transmittance (U) = 0·41 (Heat flow up)
" " " = 0·33 (Heat flow down)

Sound Insulation

Sound transmission figures can be only approximate since the type of floor construction varies widely. The following approximate figure for airborne sound (average 256—1,024 frequencies, cycles per second) allows for a floor block 4-in. to 8-in. in thickness, 2-in. concrete topping and a plastered ceiling :—

Average loss of 55 decibels.

In floor design impact sound is probably of more importance than airborne sound. As far as is known impact sound on any type of floor can only be effectively treated by the addition of a floating floor.

Applications

Phorpres hollow clay floor blocks are manufactured to comply with B.S. 1190 : 1951 and the requirements of local authorities for the construction of structural floors and roofs.

Piggery and Cattle Floors: Hollow clay floor blocks are particularly suitable for forming this type of floor. A single layer of floor blocks is bedded in cement mortar upon a prepared base of well-rammed hardcore, suitably blinded out. The floor is finished with a ¼-in. to 1-in. cement screed. The blocks are usually laid butted together with cement to give a maximum surface area without waste through cutting.
The construction provides cattle standing and bedding, which are damp and vermin-proof. The good insulation enables the animals to retain their body heat and eliminates the necessity for bedding materials. The floor requires no upkeep or maintenance, is easily cleaned and dries quickly.

This Series of Sheets on bricks and blocks covers general data on, and applications of, common, facing, cellular and keyed bricks, hollow walling, partition and floor blocks.

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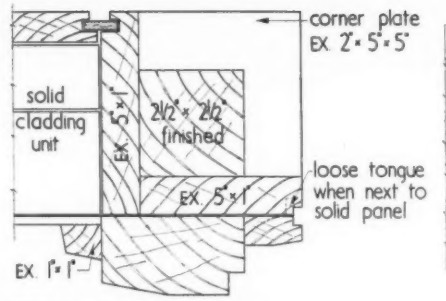
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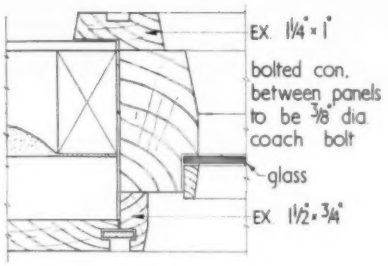
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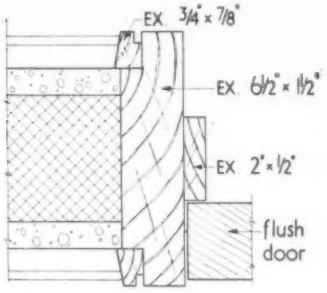
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Corner fixing of solid and glazed pre-fabricated panels



Fixing of glazed and unglazed panels



Door lining and architrave

Roof type	*Location*	*Material*	*Finish*	*Reasons*
Flat	Throughout	22-gauge corrugated-aluminium decking, covered with ½-in. insulation board	Two layers of bitumen, first layer bonded to insulation board, second layer to first, covered with ¼-in. granite chippings applied in situ with a continuous coating of finishing mastic	Both light, quick to erect and give good thermal insulation
Slight pitch	Assembly hall and gymnasium			

Internal wall type	*Location*	*Material*	*Finish*	*Reasons*
Clinker block	Throughout	Vibrated cavity clinker block	Plastered and painted	Economy, coupled with speed of erection and ease of chasing for services
Brickwork	Gymnasium and metal work room	Sand-lime brick	Fairface	

Ceiling types	*Location*	*Materials*	*Finishes*
Surface finish	Gymnasium, underside of roof decking	Corrugated aluminium	Emulsion paint
Suspended	Assembly hall	Fibrous plaster	Emulsion paint
Suspended	Elsewhere	Perforated plasterboard, 3 ft. 4 in. square, trimmed on site where necessary	Oil bound distemper

ARTIFICIAL LIGHTING

Source and fitting type	*Location*	*Illumination level and quality*	*Comments*
Mains A/C electricity	Ceilings throughout	To comply with statutory requirements using low-brightness and non-glare fittings	Assembly hall lighting gives combination of direct light from recessed reflectors with louvres for cut-off and suspended fittings giving good downward and upward light and general diffusion

Wiring and switching types

PVC insulated and PVC sheathed and tinned copper-braided cable with metal-clad switchgear. Chased round in conduit

Power supply type	*How distributed*	*Comments*
3-phase 4-wire	Paper-insulated aluminium sheathed from distribution board to sub-distribution boards with PVC braided cable to sub-mains	Specification designed to keep weight of cables running through ceilings down to a minimum

NATURAL LIGHTING

Wall glazing	*Location*	*Reasons and comments*
Window units delivered ready-glazed fixed into wood sub-frames	Throughout	To give maximum possible opening area to windows with minimum interruption of glazing bars and to enable speedy erection and closing-in of the building to protect it from weather and allow internal trades to proceed
Fixed glazing put direct into wood sub-frames with external hardwood-glazing beads fixed on site	Throughout	

Roof glazing	*Location*	*Reasons and comments*
Unit roof lights on box-frame upstand with fixed glass and hit-and-miss ventilators incorporated on three sides of the upstands	Throughout	Extensive use of roof light units to avoid windows facing aircraft works, to provide flexibility of planning and to give necessary 2% daylight factors and required amount of cross-ventilation

THERMAL INSULATION

Type	*Location*	*U-value*
Weather-boarded panels with glass-fibre linings	External walling	Approximately 0·25
½-in. insulation board on corrugated aluminium decking roof	Roofs	Approximately 0·33

HEATING AND VENTILATION: artificial and natural

Heat exchanger type	*Location*	*Criteria temperature*	*Air change rate*	*Reasons*
Heater battery and fan cabinet (re-circulated warm air)	One cabinet per area, two cabinets in large areas	62° F. internal for 32° F. external	Three per hour (classrooms)	The whole system is thermostatically controlled and of proved efficiency
C.I. radiators (hospital type)	Small administration rooms			

Boiler types and capacity	*Heat load*	*Fuel type*	*Stoking method*	*Reasons for choice*
No. 2 sectional 10 KL 1,404,000 B.Th.U.	2,210,000 B.Th.U. per hour	Washed singles	Automatic bunker to boiler worm under-feed	Ease of control, fuel and labour economy
Domestic HWS 7FN 289,000 BTU	500 gall. indirect cylinder	Washed singles	Ditto	Ditto
One GBB5 95,000 BTU	200 gall. indirect cylinder	Gas		

Water heater type	*Location*	*Fuel type*	*Stoking method*	*Reasons for choice*
Domestic boiler with indirect cylinders	Boiler-house	Washed singles	Automatic bunker to boiler, worm underfeed	Main use areas planned near to boilerhouse
Gas storage heaters	Various	Gas		To serve isolated distant sinks with small loads
Boiler	Adjacent to domestic science	Gas		Distance of domestic science rooms from boilerhouse demanded local water heating

Hot water storage type	*Location*	*Capacity*	*Comments*
Lagged cylinder	Boilerhouse	500 galls.	Normal practice
	Staff and art room lavatories	60 galls. each	Space saving; reduction of maintenance and service pipes of uneconomic length from boilerhouse
	Gas boiler room	200 galls.	ditto

Pipes and jointing types	*Location*	*Materials*	*Installation method*
Welded or screwed Class B steel barrel (heating)	Floor ducts (when over 2 in. diameter). In suspended ceilings (when 2 in. and under)	Steel	Small exposed pipes are in copper for neatness and ease of installation. Pipes in ceiling spaces are threaded through open lattice beams, and holes are drilled through ply sides to main beams
Class B galvanised barrel (hot water)		Galvanised iron and copper	

Cold water storage	*Location*	*Materials*	*Capacity*
Daily reserve of 4½ gall. per head	Tank room behind gymnasium, over cleaners' room and apparatus store	Galvanised mild steel	1,500 gallons

REFUSE METHOD

Refuse method	*Type of refuse*
Kitchen bins	Food waste
Boiler house bins	Clinker and ash

SPECIAL ACOUSTICAL TREATMENT

Sound absorption material	*Absorption coefficient*	*Comments*
Perforated plasterboard with glass fibre backing	0·20, 0·70, 0·30	Ceilings throughout are designed to absorb external and internal noise. Reverberation times 1·30, 0·65 and 0·48
Wood-battening with resin-bonded glass fibre backing in assembly hall and gymnasium	0·20, 0·75, 0·65	

Reflectors

Canted ash ply-faced frame over apron stage

Sound insulation	*Location*	*Insulation standard*	*Comments*
Cavity clinker-block partitions plastered	Throughout	35 decibels	The physical difficulty of carrying partitions up from ceiling level to underside of roof and maintaining perfect seal from room to room has meant a considerable falling-off of insulation standards owing to sound jump over tops of partitions. Various methods of dealing with the problem are still being tried

SOIL WASTE

Type of system	*Location*	*Materials*	*Method and comments*
Separate system direct to main sewer	Under site slab	Generally cast iron under building; sgw underground	Pre-fabricated wastes to lavatory basins. Drains collected to internal manholes generally, and then discharged to manholes picking up main runs of drains outside the building

Drain types	*Location*	*Materials*	*Method and comments*
Acid collection and dilution	Science laboratories	Moulded polythene	All runs from sinks to acid receivers in pre-fabricated units assembled on site

Rainwater disposal type	*Location*	*Material*	*Comments*
Roof sumps	Internal pipes	Aluminium alloy clear-lacquered	All r.w.p's internally are free standing. Shallow gutters on pitched assembly hall and gym roofs. Water pipes to soakaways

FIRE

Structural precautions	*Grade of protection*	*Apparatus, sprinklers, etc.*	*Fire hydrants*	*Planning precautions: access for fighting*	*Means of escape*
None	None	Hose reels spaced to cover whole interior of building	Externally	All to comply with MOE regulations and County Fire Brigade recommendations. Hard areas for access of tenders to hydrant positions	From assembly hall by panic-bolted doors; from remainder of building by frequently placed doors or by windows

COLOUR

Paint types	*Where used*	*Colour treatments*
Oil paint gloss	Lavatory, changing-rooms, and kitchen walls. Internal and external woodwork	Only nine colours of the Munsell range used, including neutral greys. Bright or dark colours confined generally to circulation spaces and some wall areas in large rooms, e.g., assembly hall. Quieter colours used mostly on pin-up areas in classrooms. Everywhere colour has been thought of in relation to the large quantity of natural timber
Oil paint semi-gloss	Assembly hall ceiling and walls throughout	
Flat oil	Pin-up areas	
Oil-bound distemper	Ceilings generally	
Plastic varnishes	Internal and external woodwork	

FURNITURE AND EQUIPMENT

Designed by County Architect's department. Loose furniture and equipment was selected—subject to approval—by the furniture sub-committee of the Education Committee. Light fittings are standard products, but were mostly designed to meet MOE requirements. Pottery display-cabinet designed by architect

TIME SCHEDULE

Drawings	*Contract signed*	*Work commenced*	*Work completed*
Design, 520 man hours. Working drawings, 6,900 man hours. Supervision, 600 man hours	April, 1953	April, 1953	September, 1954

Type of contract	*Comments*
Herts. C.C. Lump Sum Contract including Bill of Quantities	The frame (columns and beams only), roofing-material, heating and hot water installation, door furniture, sanitary fittings were either the subject of standard agreements or bulk purchase contracts with the County Council

SITE AND PLAN ANALYSIS

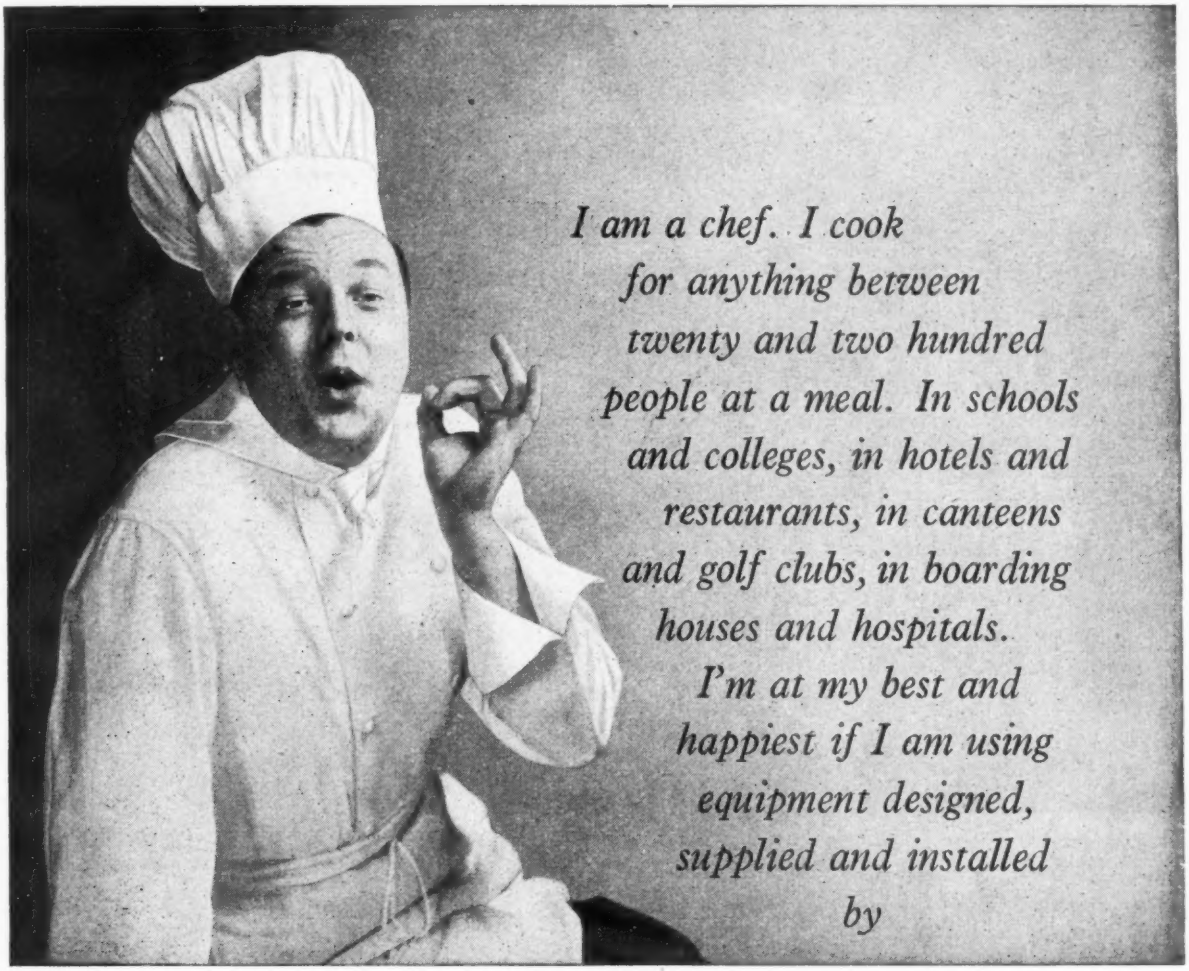
Site accommodation	*Area in acres*	*Per cent. of total*
Building	0·9	8·9
Playing fields	4·54	44·8
Hard playing areas	0·85	8·4
School garden	1·5	14·8
Planting near building	1·75	17·3
Roads	0·25	2·45
Paths, paving	0·25	2·45
Caretaker	0·10	0·9
Total	10·14	100·00

Plan accommodation	*Area in sq. ft.*	*Per cent. of total*	*Area per place*
Hall and stage	3,839	10·2	7·5
Gymnasium	3,030	8·3	5·9
Library	1,000	2·7	1·9
Store (teaching)	1,232	3·2	2·2
General and practical classrooms	15,781	42·2	30·9
Dining (in teaching area)			
Pupils storage, sanitary accommodation	3,430	9·2	6·7
Staff rooms	1,883	5·0	4·0
Service, kitchen and boilerhouse	2,170	5·8	4·2
Circulation	5,006	13·4	9·8
Total	37,371	100·0	73·1

COST ANALYSIS

Drainage works beyond m.h's adjacent to building	£1,219
Roads, paths and fencing	£6,449
Site layout, planting	£5,542
No. of form entries	3
No. of places	510
Floor area (sq. ft.)	37,371
No. of sq. ft. per place	73·1
Net cost	£119,610
Net cost per place	£234 10s. 7d.
External works	£13,210
Gross cost	£132,820
Gross cost per place	£260 8s. 8d.
Tender date	March, 1953

Element	*Cost per sq. ft.*	*Element*	*Cost per sq. ft*
	s. d.		s. d.
Preliminaries and insurance	2 1	Ironmongery	0 4
Work below ground floor level	4 6	Plumbing (external)	2
External walls and facings	3 7	,, (internal)	2 6
Internal load-bearing walls and internal partitions	1 8	Sanitary fittings	11
Frame	6 7	Gas installation	7
Roof	5 5	Electric installation	3 9
Roof lights	1 9	Heating installation	7 1
Floor finishes	4 5	Ventilation	1
Ceiling finishes	1 6	Drainage	1 10
Windows and doors (external)	1 7	Glazing	11
Doors (internal)	5	Decorations	2 1
W.C. doors and partitions	5	Playgrounds and paved areas	3 10
Cloakroom fittings	4		
Wall finishes	1 8	Total	64 0
Built-in fittings and fittings	4 0		



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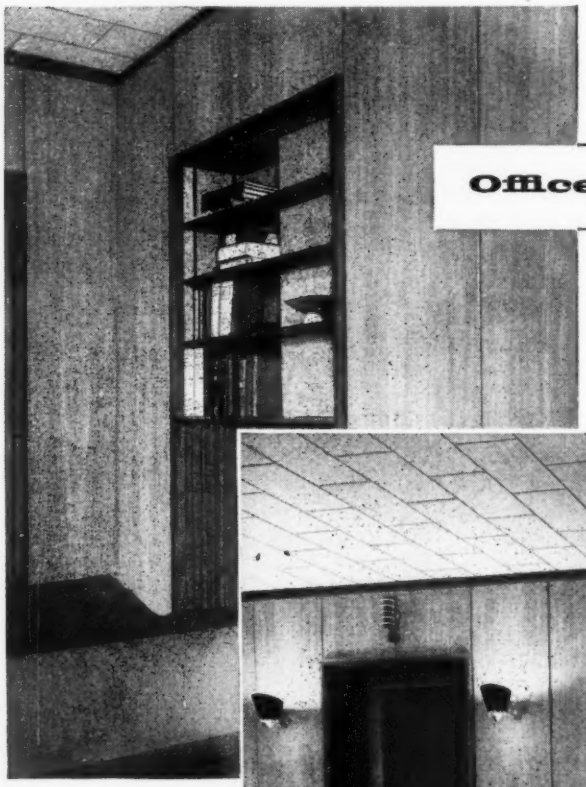
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TECHNICAL SECTION

Our publication in this issue of a report on this year's International Lighting Congress follows closely on the publication of the new BRS Digest No. 80* on the prediction of levels of daylighting in buildings. It is natural that we, in this country, with our long periods of overcast sky, should have given more attention to problems of daylighting than other nations, but even here there is a certain lack of understanding between the experts and the architects. One reason is that there is a feeling among architects that calculations are difficult and tedious and that the level of outdoor illumination is so variable a factor that the precision of these calculations becomes irrelevant. In fact, our lighting policy is based on a " 500 foot candle sky," though an overcast sky can easily rise to twice this figure and though it has been shown that on an average of 33 days in the year it will fall below it even at noon. This consideration, however, must not be allowed to discredit our attempts to raise our knowledge of lighting from rule of thumb to something approaching an exact science. The new Digest is most useful in that it summarizes the various practical methods now in use. This has not been done for us since the Post-War Building Study on the Lighting of Buildings of 1944, which dates from those carefree days when we thought that we had only to calculate the *direct* component. . . .

* HMSO 3d.

This week's special article

24 LIGHTING
report on this year's session of the commission internationale de l'éclairage

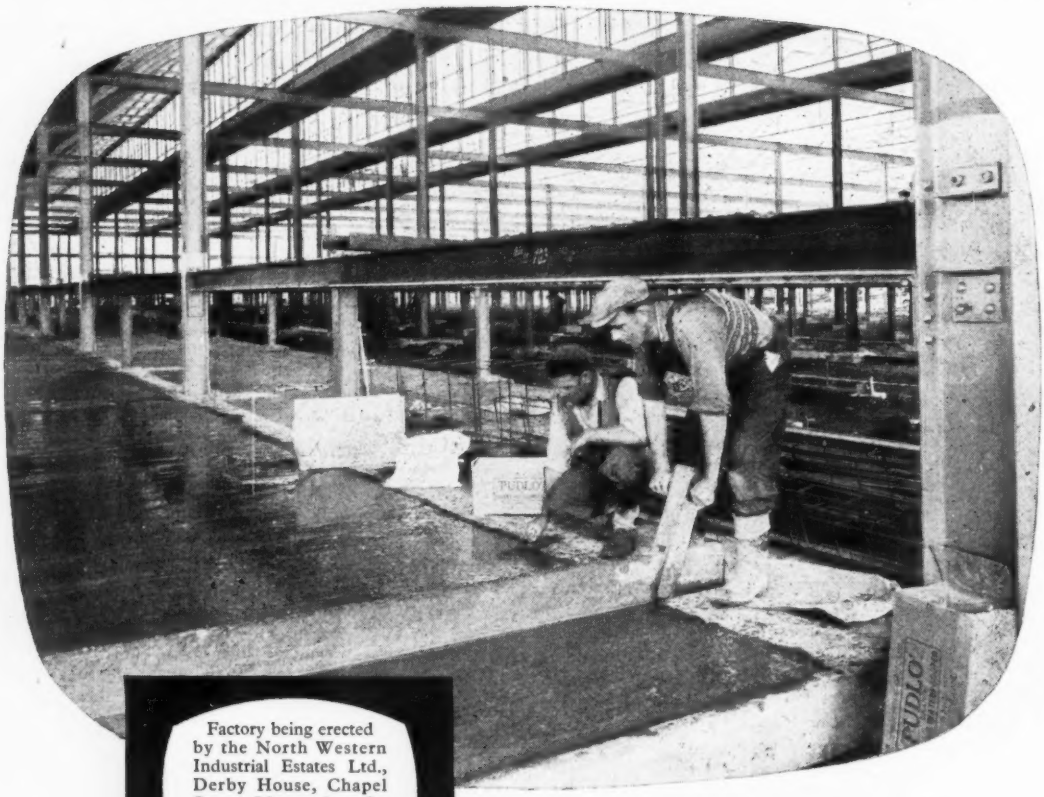
The number preceding the week's special article or survey indicates the appropriate subject heading of the Information Centre to which the article or survey belongs. The complete list of these headings is printed from time-to-time. To each survey is appended a list of recently-published and relevant Information Centre items. Further and earlier information can be found by referring to the index published free each year.

The Commission Internationale de l'Éclairage meets every three or four years to discuss all matters to do with lighting, either by daylight or by artificial sources. At this year's meeting, which was held in June at Zurich, a number of reports were presented on subjects of interest to architects, and we have therefore asked one of the British representatives to record them.

Not all of the 40 different aspects of production, measurement and use of light discussed at the meeting were of interest to architects, and of those which were, not all contributed to the British architect's store of information. Characteristically, the sessions concerned with the principles of lighting were most fruitful and those which dealt with the application of lighting to different classes of building were less so. This reflects the familiar time lag between research and application and suggests a certain lack of interest on the part of architects in the specific problems which lighting poses.

COLOUR RENDERING

This subject has assumed importance almost entirely on account of the widespread use of fluorescent lamps which give various kinds of " white " light, but none of which give exactly the same colour rendering of objects as filament lighting or daylight. This is mainly due to the distribution of energy in the visual spectrum not being a smooth curve, but having sharp concentrations of energy in various regions (particularly in blue, green, violet, and yellow). These concentrations, which are super-imposed on the smooth colour distribution of the light from the fluorescent powder, are liable to cause



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unnatural emphasis or distortion of some surface colours. The recently introduced "de luxe" lamps have been a great improvement in this respect and one way in which this problem may eventually be solved was discussed at the conference by Dr. Kruithof of Holland, who described the use of a fluorescent powder which absorbed one of these bands of concentration and re-emitted the energy in a "smoother" manner, mainly at the red end of the spectrum where there is generally rather a deficiency (see Fig. 2). The distinction was carefully drawn in the discussions between the colour of the light from the lamp and its colour rendering properties, as these two factors are not necessarily related. There are two main difficulties about the specification of colour rendering properties, the first is to agree on what the "true" colour of an object is. Whether it is the colour seen in filament lighting or in daylight, and if the latter, in what sort of daylight, and whether this is the most desirable colour of the object, e.g. for the complexion, butter, meat, etc. A recent experiment found that daylight gave a colour rendering outside the range which was considered "fair." The second difficulty is that the eye becomes more or less adapted to the prevailing colour of the light so that it is pointless merely to calculate the physical change of colour from one illuminant to another by use of the spectral energy distribution data. Comparison can be made theoretically and experimentally (visually) between the appearance of colours under two different types of illuminant which have the same apparent colour of light (often specified by "colour temperature"). Mr. Hesselgren of Sweden particularly emphasized the necessity of determining these shifts by subjective judgment, and Mr. Winch of this country has already shown a way in which this can be done by binocular comparison.

It is generally agreed that the most practicable way to specify colour rendering of a source is to state the relative amount of energy emitted in each of the 8 regions into which the spectrum is divided (see Fig. 1). These figures enable a rough comparison to be made between various sources, but are not an adequate substitute for the spectral energy distribution curves for calculation purposes. The additional details of information given in this latter method of specification can be seen in Fig. 2. Moreover, the large extent to which any of the bands can be reduced without affecting colour rendering judgment was indicated in the work reported by Dr. Crawford of the National Physical Laboratory. A more practical method for comparison of sources which was discussed was the use of certain pairs of colours (metameric pairs) which match under a standard illuminant (e.g. daylight) but which will only match under any other source if its properties are comparable with the standard illuminant. Several countries reported the use of these test colours, and it was generally agreed that this was a critical test, although no account was taken of subjective preference of one sort of colour rendering over another.

Among other points discussed in this field were the necessity of standardizing some particular spectral distribution of daylight (including the ultra-violet content) and some means of obtaining it. Hopes were expressed that work on the recently developed Xenon arc lamps would be continued with this object in view and that it might result in the development of a suitable standard source. The standardization of the ultra-violet content of daylight was raised in the colorimetry committee in connection with the measurement of daylight fluorescing dyes which are now widely used for the whitening of papers for printing and photography and to enable many washing powders to give "the whitest ever wash."

With regard to the differences in colour between two fluorescent lamps of the same type, the problem was put in its right perspective by the report that differences in measurement of the same lamps by different laboratories were often of the same order of magnitude, but it is evident that there are still some real differences between the products of manufacturers.

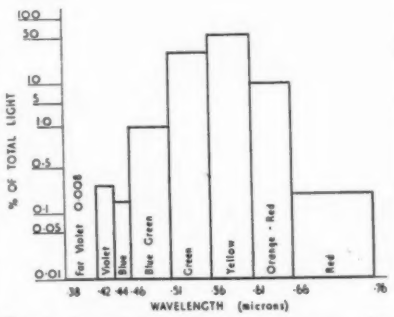


Fig. 1. Spectral band distribution of warm white fluorescent lamp.

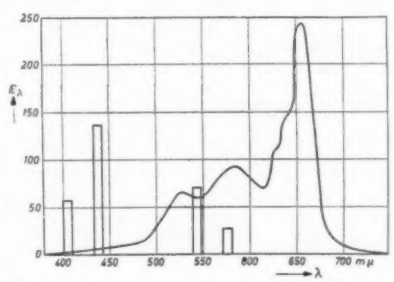


Fig. 2. Complete spectral energy distribution for warm white lamp. Note: the vertical component represents relative energy, the horizontal component shows wavelength.

It is evident that problems of the appearance of colours in artificially lighted interiors are still rather troublesome and there is much work to be done before practical experience can be dispensed with.

LIGHT SOURCES

In the matter of new sources of light, the most important advance as far as interior lighting is concerned is probably the availability of high pressure mercury vapour lamps with fluorescent powder on the outer bulbs providing a reasonable degree of colour correction. They are, if anything, more efficient than the plain mercury street lighting lamps, and it is to be hoped that these latter will eventually disappear from the factories where they have often been used for high-bay lighting—and take the green corpses with them!

The new light source, the electroluminescent lamp in which light is produced by a luminescent powder held between the transparent conducting plates of a condenser has only arrived at the stage of technical discussion. Its efficiency is rather low at present, but it is understood to have found an application already in the lighting of photographic processing plant with a low-level of non-active light. A source which is in the form of a large plate of low brightness has interesting possibilities in design, but in its present state of development, it is more likely to be restricted to special applications, for instance the lighting of spaces with limited headroom such as submarines. It might also at a later date be considered for use in mines, where its low brightness and relative robustness would be great advantages provided that the supply and safety problems could be satisfactorily solved.

DAYLIGHTING

The way had been prepared for some rather important recommendations on changes in the technology of daylighting by an inter-sessional meeting in 1953 and a pre-sessional meeting at Zurich a few days before the congress.

The technologists of daylighting have been mainly concerned with the refinement of techniques for prediction of the quantity of daylight for use in the design of a building. This refinement is not required for academic reasons, but buildings which have been designed using approximate methods have often been found to have measured daylight factors which departed appreciably from the designed figures. Moreover these approximate methods do not permit calculation of the changes in daylighting produced by changes in the reflection factor of the surfaces of the room or the surroundings, since the contribution of light reflected from these is ignored. The points in the calculation techniques which were discussed, and the recommendations made were as follows.

(*a*) *Definition of Daylight Factor:* It was agreed that this should continue to be expressed as a ratio of the internal illumination to the external illumination on a horizontal plane from an unobstructed sky, but it does not restrict the application of this term to the illumination on an *internal horizontal* surface, so that it can refer to vertical or inclined surfaces inside the building. (Sunlight of course must be excluded from all measurements.)

(*b*) *Components of Daylight Factor:* It was agreed that the daylight factor should be recognized as consisting of three components.

1. Sky component. The component received directly from the sky itself. (Identical with sky factor for unglazed opening and a uniformly bright sky).
2. External reflected component. The component received by direct reflection from the external surfaces.
3. Internal reflected component. The component received by reflection and inter-reflection from internal surfaces.

(*c*) *Sky Luminance* (*Brightness Distribution*): Daylighting calculations have hitherto been mainly based on conditions assuming an overcast sky of uniform luminance all over. While it is recognised that an overcast sky usually represents the conditions of worst daylight (in temperate climates at least), it has been pointed



See-

HOW THE SCENE CHANGES

Garage with conventional lighting. Note the confusion of beams, pipes, trunking, wiring and light fittings.



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out that an overcast sky is rarely, if ever, of uniform luminance, and that it usually is much darker towards the horizon than at the zenith. A formula derived by Moon and Spencer appears to describe the variation in luminance with angle of altitude accurately over a wide range of latitude in the temperate zone of the northern hemisphere. It has therefore been agreed that whenever daylighting design is based on an overcast sky, the luminance distribution given by this formula should be used as the basis for calculation and measurement, unless it is known that some other distribution applies.

Where it is required to compare measurements made in a building with calculated values it is, of course, necessary that the sky luminance at the time of measurement should be as close as possible to that on which the design was based. For this reason, and also to extend application of calculation methods, it was requested that all countries interested in basing design not solely on the overcast sky should collect information on the luminance distribution of those skies which are typical for their countries. It may thus eventually be possible for us to calculate the change of daylighting quantity and quality when overcast sky gives way to, for instance, clear blue sky, or partially broken sky. At present there will be difficulty in arriving at widely applicable formulae for these skies than in the case of the overcast sky.

Various techniques of computation of daylighting have now been developed, some of them elaborate and precise, and others adopting simplifications which their originators regard as justifiable in view of the lower degree of accuracy required in practice.

A paper was given in general session by Dr. Hopkinson on behalf of a team of research workers and architects, describing a practical method of daylighting design which was based on the latest techniques of computation and experimental work. This method, which was described by Dr. Hopkinson in detail in two articles (AJ, Aug. 5 and Sept. 16, 1954), is arranged as a logical extension of the existing use of the BRS sky factor protractors. Briefly, the way in which each factor in the design is tackled is as follows.

1. Direct component. This is estimated by the use of the appropriate protractor (for glazed apertures where relevant), in conjunction with a table of sky brightness factors which provides correction factors for the non-uniformity of sky luminance.

2, Indirect component (external and internal). This is determined from a series of nomograms which allow for the ratio of window area to total room surface area, and average reflection factor of room surfaces. These nomograms are based on classical theory of light integration and on formulae and simplifications developed by Dresler and by Arndt. The data can alternatively be presented in the form of circular calculators. This indirect component (obtainable as an average value in the room or as a minimum value in the room) only needs to be added to the direct component to enable the total daylight factor to be estimated.

The experimental verification of this method by measurements in completed buildings and models was described. Use of the latter also enabled subjective studies of the effect of distribution of daylight and luminance and colour of the room surfaces to be carried out. For measurements in completed buildings a new portable daylight factor meter was described (see Fig. 3).

This approach to the technique of design seems to have been acceptable to a number of architects, and at the meeting, Mr. Voltelen of Denmark recommended that training in these technical methods should be introduced into schools of architecture. However, he went on to make a plea for revision of daylight regulations and standards in terms of physical dimensions which would seem to aim at making such technical training unnecessary. In spite of the prevalence of sunshine at the time of the conference—or perhaps because of it—it was decided that time did not permit discussion of the problems of sunlight, wanted and unwanted, and the extent to which it should be taken into account in daylighting design.

COMFORT IN LIGHTING

This is one of the new subjects allocated to a separate committee at the 1951 session. Its

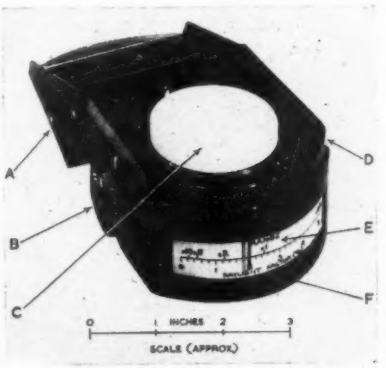


Fig. 3. The "E.E.L." BRS Daylight Factor Meter. A, Louvred mask for standardization on sky. B, On/off switch. C, Cosine-corrected light receptor. D, Sensitivity control knob (not shown). E, range scale. F, Daylight factor scale. The instrument is allowed to view a small unobstructed patch of sky at an elevation of 45° by swinging the mask into position over the cell. The sensitivity knob is then adjusted to set the pointer on the appropriate range scale. Daylight Factor at any point in the room at which the meter is put can then be read directly when the mask is swung away from the cell.

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emergence from the academic studies of visual research into a major practical study is another indication of the effectiveness of efforts of the sensitive lighting designers to persuade engineers that there is more in lighting than just foot-candles. So far, scientific workers in the field of subjective study have only been able to define the reverse side of this problem; the phenomenon of discomfort glare. This is a disappointment to some people who are anxious to see sound guidance available for the production of some positive effects of lighting on what are called the "affective states" or perhaps the "atmosphere" produced by a lighted interior. However, it cannot be denied that an agreed basis for predicting whether any discomfort glare will be produced by a given arrangement, and if so how much, is a valuable step forward.

In the secretariat report, the present available data on this problem were reviewed, together with experience as to their validity, and a relatively simple basic formula arrived at by Hopkinson, after informal international discussions during the 1951 meeting, was presented. The complete method of calculation of discomfort glare which Hopkinson suggested was a synthesis of the international data. He proposed that this method should be used immediately to compute preliminary glare tables which could be put into circulation quickly and that the experience derived from the use of these should be reported.

At a meeting of this committee, there was considerable discussion of the validity of this method, and of a formula proposed by Dr. Guht of the U.S.A. for calculating the effects of a multiplicity of sources, and dealing with many of the practical problems. It was finally agreed however, to pass the recommendation that such tables should be drawn up with due consideration to the ways in which the information could be most readily understood and applied by designers of lighting installations,whether architect-designers or engineer-designers.

A lengthy and interesting discussion took place, in which M. Kalff of Holland was a central figure, concerning the relation between (*a*) design for positive aspects of comfort, that is, the production of the most advantageous environment for a person to perform a given function associated with vision; and (*b*) design merely for the avoidance of discomfort. It was generally held that the first matter was in the province of the artistic designer who might find difficulty in expressing himself in terms of rules and formulae, whereas the job of the engineers was to provide these rules and design data as a framework within which the designer should work. On the other hand, the separation of these two classes of specialists in this field of work was strongly deprecated in some quarters and when a decision was finally made to separate these two aspects of the problem in two working parties, agreement was only reached on the understanding that there would be the closest cooperation and even overlapping of the personnel between the two.

It is to be hoped therefore that before long, architects concerned with lighting design may have available tables with which an installation can be designed with avoidance of any degree of direct glare, and perhaps at a later date, some principles of a technique of positive lighting design for the best performance of a given visual task.

Mr. Hesselgren of Sweden in a paper in a general session explained his views of how this problem could be tackled with the aid of experimental psychology. He emphasized that it would be necessary to study the subjective reactions to the stimulus rather than the characteristics of the stimulus itself. This he calls phenomenology, and it is evident that there is much in common between Mr. Hesselgren's approach and that of many of the workers in the field of subjective studies on acoustic requirements, visual comfort, and colour "conditioning," who have realised for some time that the human being is the best judge of his surroundings. The main barrier however, between Mr. Hesselgren and his



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audience seemed to be the technical language and conceptions of psychology which he insisted must be learnt before any progress could be made on this problem. It was not quite clear whether he hoped the phenomenological approach to lighting would result in positive rules and tables for the guidance of designers, or whether it would be used simply as a discipline in which to train architects and engineers so that the former could express their requirements in a more definite way, and the engineers could have more understanding of the mechanism of the production of these requirements.

PREDETERMINATION OF ILLUMINATION AND LUMINANCE

The deliberations of this committee are at present at the technical argument stage. The committee has two interrelated problems to consider. Until recently, the architect or lighting designer could only readily determine the average illumination on a given horizontal working plane in a given room with a set type of lighting installation. This has generally been done with the aid of convenient tables in which room characteristics and fitting characteristics were related.

The first problem of this committee is to bring these tables, which were based on empirical determinations, up to date, to be applicable to currently used fittings and techniques of lighting and decoration, and to decide on the best methods of calculation in order to be able to obtain accurate data about a wide range of conditions in cases where it should be required. The attention given to the second problem (the pre-determination of luminance) is an indication of the extent to which lighting engineers have been pressed by architects and designers to provide a technique with which the arrangements of brightness pattern of ceilings, walls, etc., can be designed to produce the desired atmosphere or contribution to visual efficiency. The two problems are of course complementary, as it is the luminances of the room surface which provide the indirect component of the illumination on the working plane.

The ultimate goal of this work is to be able to pass over to the designers a relatively simple set of tables or calculators which can be applied with a known degree of accuracy, and it is hoped that the working party which is to be set up will be able to sort out the large mass of complicated data during the next four years and produce some practical information in a form in which it can readily be used. In the meantime, considerable interest has been shown by architects in a technique described at a general session by Mr. Waldram (see AJ July 22, 1954), which works the opposite way round, and provides a means of determining the light distribution characteristics required from the fittings and their arrangement to provide a previously specified pattern of apparent brightness.

Another useful tool for immediate use is a simple formula which was proposed by Dr. Hopkinson. Based on the daylighting studies, this formula enables the average amount of the component of illumination on the working plane reflected from the room surfaces, to be calculated with a reasonable degree of approximation.

Reports were received from six different sub-committees on the application of lighting to hospitals, public buildings, industrial buildings, schools and offices and homes and hotels. Of these, the reports on industrial lighting and on homes and hotels did little more than describe current practice, while the reports on hospitals and on schools and offices, though more thorough, added little to the information already disseminated by the Nuffield Foundation and MOE. In the public buildings report, however, there was an interesting contribution on the specialized subject of museum lighting.



Fig. 4. Tapestry from the Metropolitan Museum, New York lit, above, by concentrated light beamed at less than 15° from the vertical and, below, lit by light beamed at 30° from the vertical.



MUSEUM LIGHTING

The researches on deterioration of delicate objects due to light have resulted in the International Commission on Museums being able to make some positive recommendations for the lighting of valuable paintings, textiles and manuscripts which should reduce deterioration to a minimum compatible with attractive and adequate lighting. These recommendations are as follows:

(*a*) That the illumination level on the object should never be appreciably greater than that necessary for normal seeing, whether provided by daylight, fluorescent lamps or filament lamps. The three sources have been ranked in this order as possible causes of deterioration.

There seems little difference between one type of fluorescent lamp and another from the point of view of possible damage from the radiation, as long as certain types with a continuous energy emission in the ultra violet region of the spectrum are avoided. It is recommended, however, that the use of fluorescent lighting should involve the observation of the following precautions.

1. A sheet of ordinary window glass should always be interposed between the object and the source, to reduce the small amount of ultra-violet light to negligible proportions.
2. General lighting (" éclairage d'ambiance ") should preferably be indirect, as also the lighting of show-cases where possible.
3. Auxiliary gear (starter etc.) should be kept outside the show-case to limit the temperature rise, which encourages deterioration, particularly in a humid atmosphere. Condensation must therefore also be avoided at all costs.

Work is still in progress on this problem of deterioration, in order to be able to be more precise about the effects of radiant energy on various types of materials, dyes and pigments.

A most valuable paper was presented at the meeting by Mr. Harrison of the Metropolitan Museum of Art of New York, in which the function of museum lighting was analysed in relation to the visual and emotional (subjective and psychological) requirements. Mr. Harrison had arrived at some useful recommendations as a result of his careful study and experience. The four which he gave were :

1. Colour of artificial lighting should correspond to a colour temperature of 4,000° K. with the smoothest possible spectrum. This colour is a little warmer than the standard cool white deluxe lamps which he recommended to be mixed with 25 per cent. of light from filament lamps in blue glass " daylight " bulb.
2. Paintings require a higher level of concentrated light for colour saturation through protective films (varnish). Sculpture requires higher relative values of diffuse light because of shadow contrasts.
3. Vertical illumination should be approximately equal to horizontal illumination to provide for varying planes of viewing.
4. Vertical illumination should be presented at an incident angle of 60° (30° from the vertical) to avoid shadows from frame projections, or textural shadows on tapestries, etc. Most specular reflections from varnish or protective glass are thereby thrown to the floor. The recommendation of this committee was that the maximum of information on the lighting of museums and art galleries should now be collected together and published possibly with the help of U.N.E.S.C.O. so that it can be readily available to the directors of these institutions. The only other recommendation which went forward from this committee was that a maximum of data on conditions of lighting comfort in theatres and cinemas should be collected, with special reference to the regulating of the intensity and chromaticity of the light in relation to the particular requirements of the various parts of these buildings (e.g., auditoria, foyers, corridors, etc.).

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Buildings Illustrated

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Announcements

TRADE

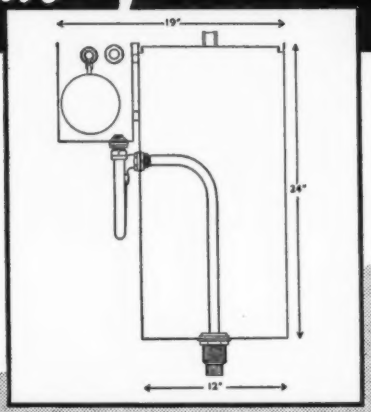
Messrs. Samuel Morrison & Partners (S. Morrison (A), G. E. Grey (A), and W. J. Farmer (A)), of St. Alkmunds House, Belper Road, Derby, have opened a branch office at 30b, Wimpole Street, London, W.1, telephone number HUNter 0806, where they will be pleased to receive technical literature, samples, etc.

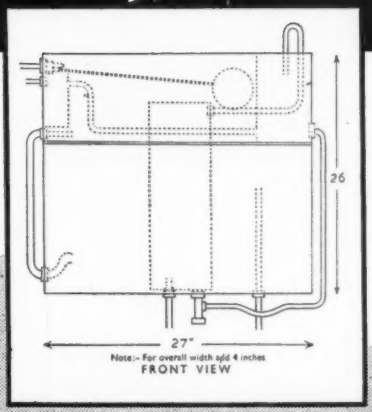
Messrs. H. Newsum Sons & Co. Ltd. were responsible for the roofing of St. Mary's Church Hall, Chessington, illustrated in the JOURNAL for August 11. In that issue we announced only that they were responsible for joinery.

Mr. W. Plumb has been appointed Deputy Commercial Manager for the Liverpool and Netherton Works of the English Electric Co. Ltd. His former position of Manager of the Leeds Branch Office has been taken over by Mr. A. J. Evans.

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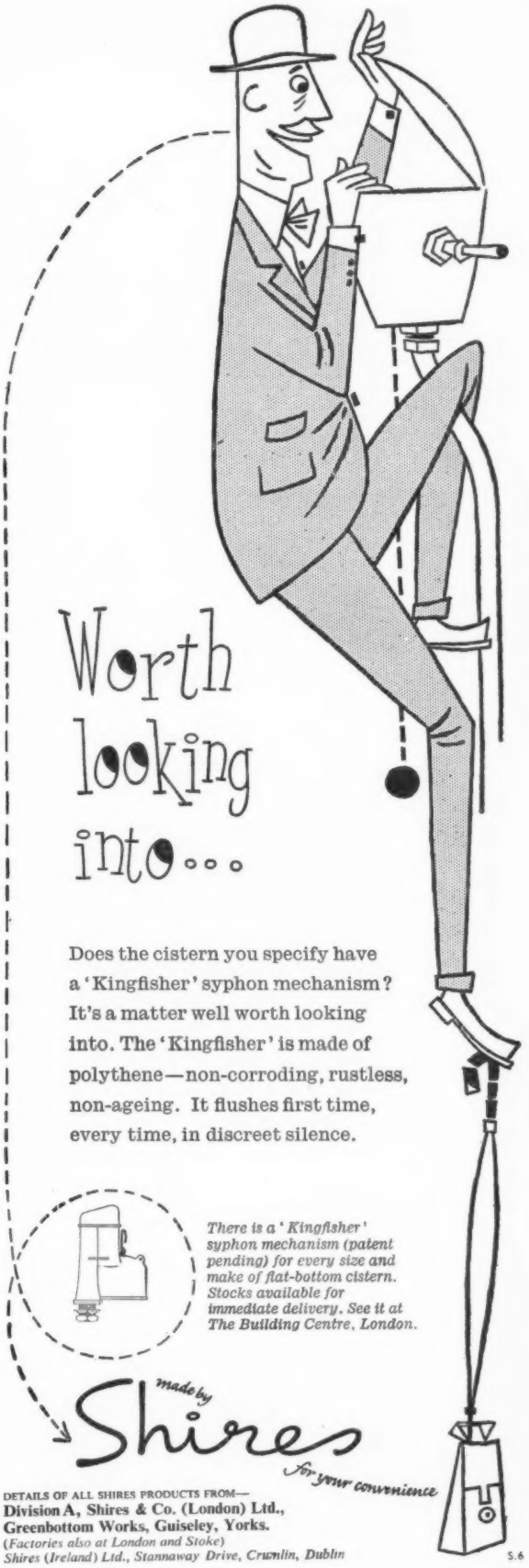
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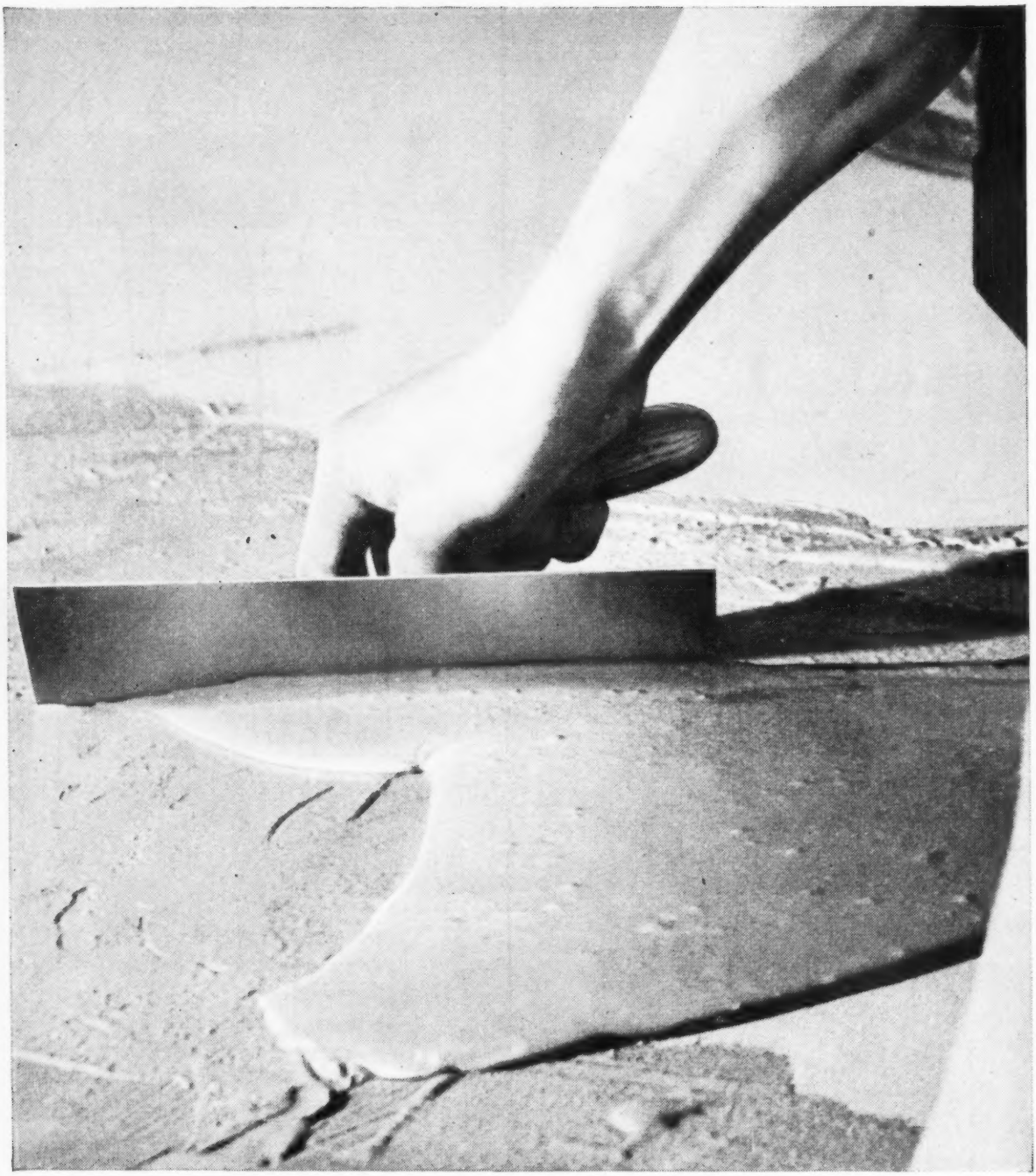
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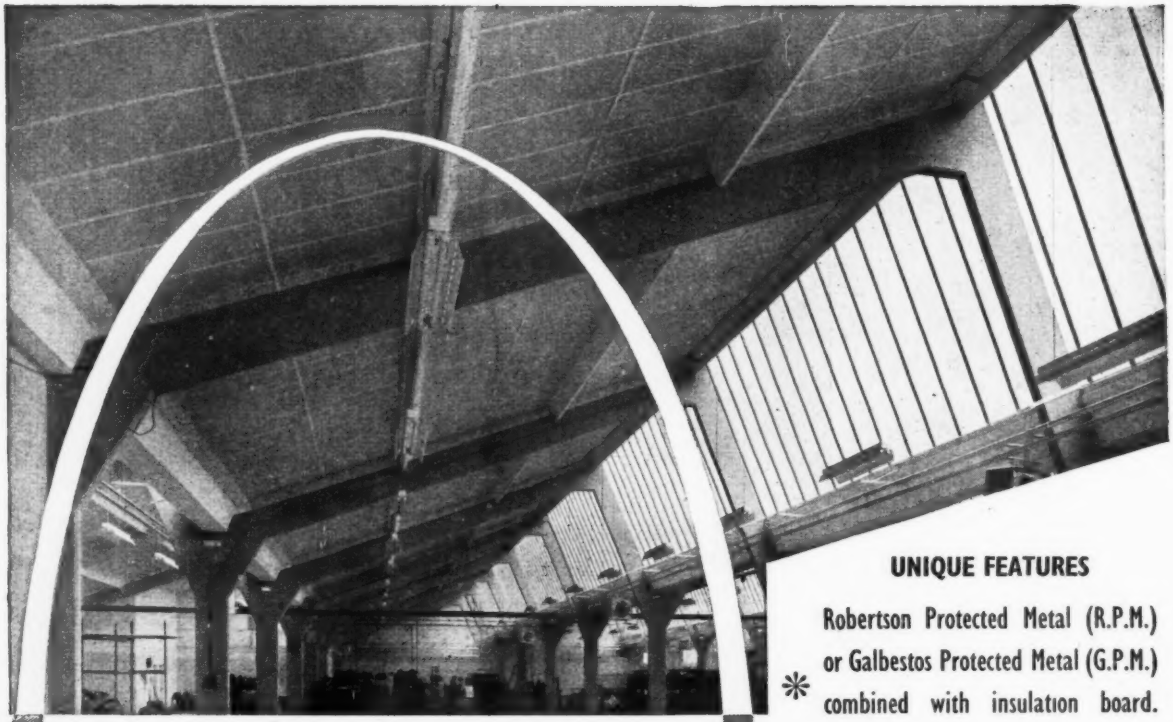
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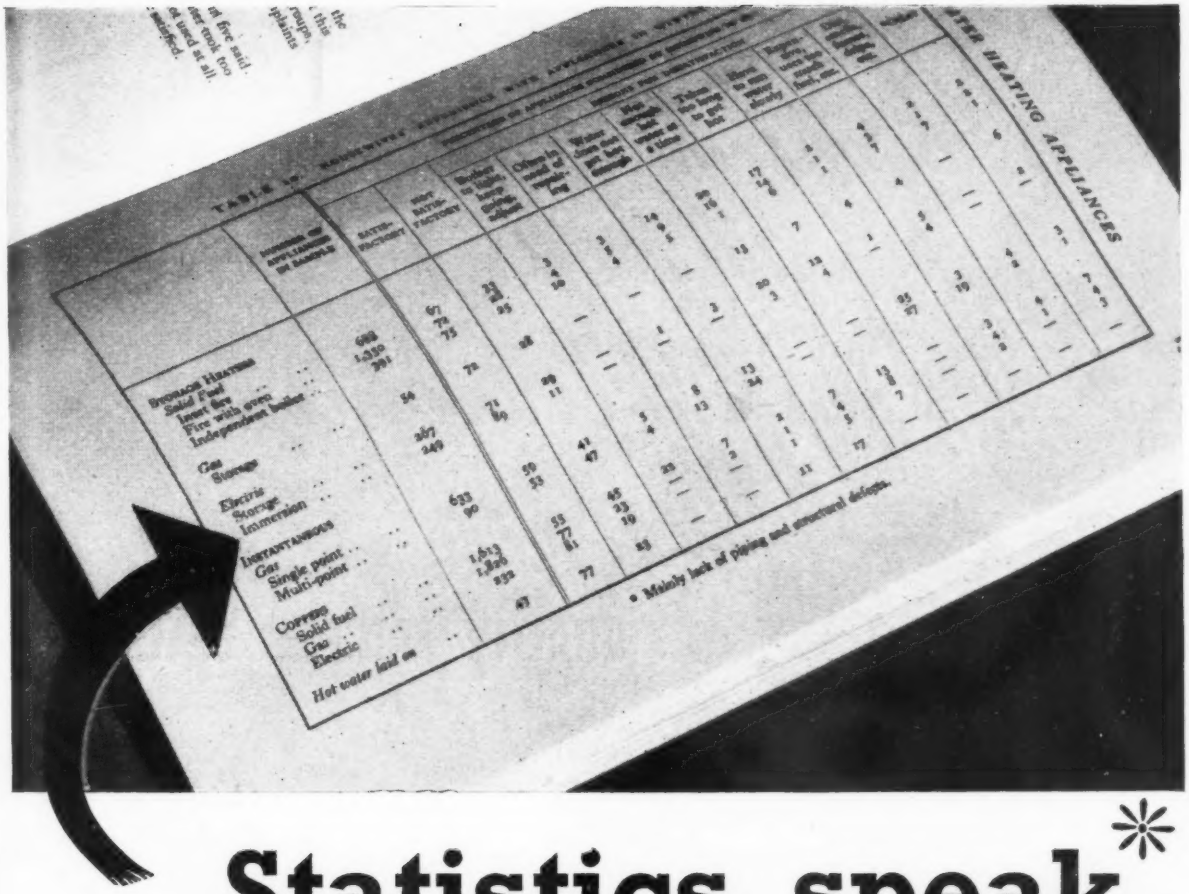
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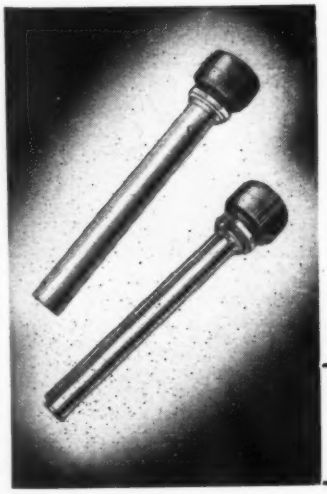
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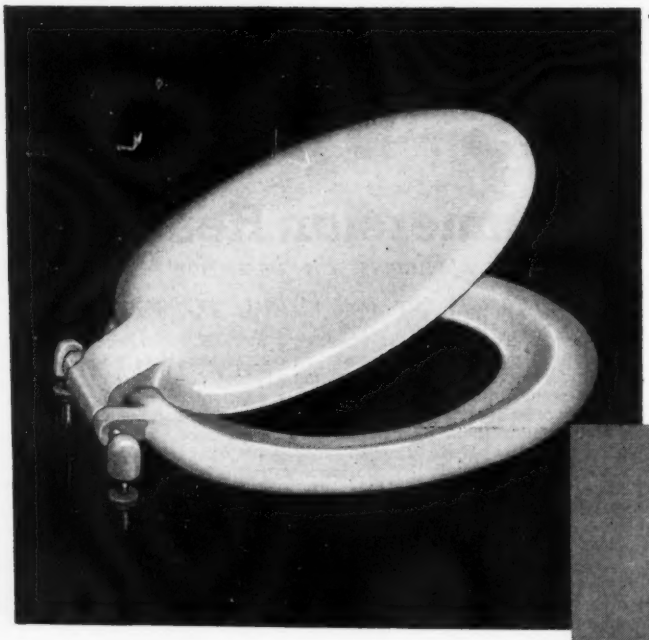
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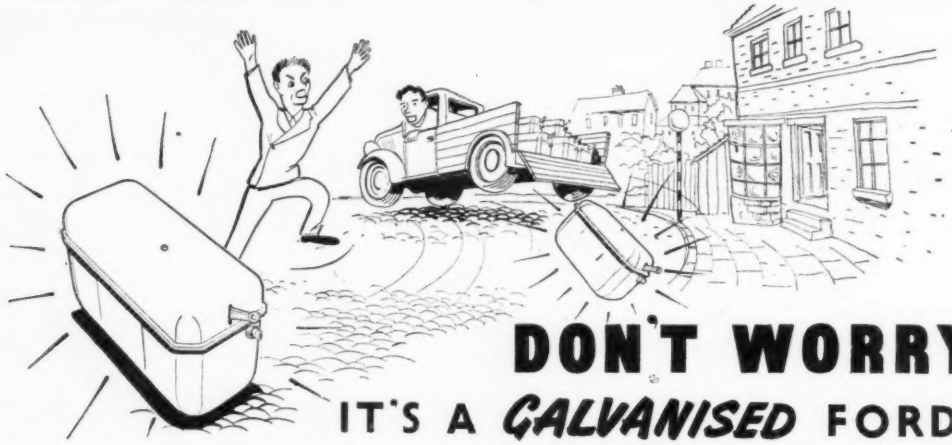
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Plastaweld can be plastered at any time after drying

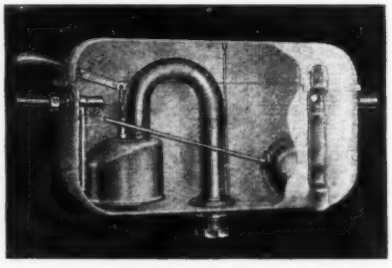
Face coats can be applied direct on painted or smooth brickwork!

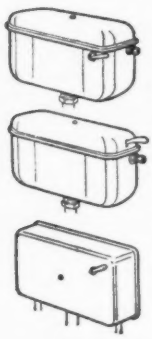
Technical and Trade Enquiries to Sole Manufacturers:
J. MANGER & SON LTD., *Dept. A.J. 57d Kingsland High Street, London, E.*
Telephone: Clissold 5307.



DON'T WORRY
IT'S A *GALVANISED* FORDHAM

Pressed from a single sheet of steel, the Fordham shell will stand up to almost any treatment. It is surprisingly light, nevertheless, and child's play to install with its ingenious concealed brackets. Send today for full details of the Fordham range.



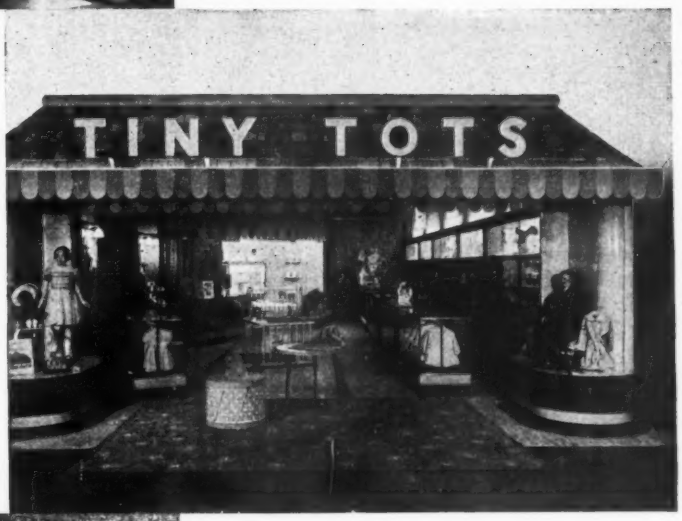


Fordham FORDHAM PRESSINGS LTD.
DUDLEY ROAD, WOLVERHAMPTON Telephone: 23861



Shopfronts

and Interiors





by **POLLARDS**

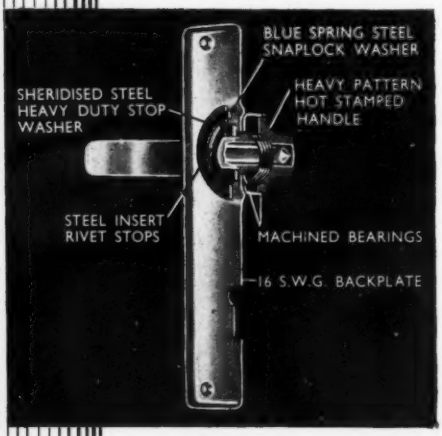
E. Pollard & Co Ltd *159 St John Street, London EC1 · Tel: CLErkenwell 6701 ·*



A Name to THIS HANDLE!

The SNAPLOCK Reversible Lever Handle

Here is a new lever lock set that is proving a big seller, for in design and construction it incorporates many special features. The set can be taken to pieces for cleaning and examination and can be easily reassembled, whilst reversing the handle for right or left hand use is only a matter of seconds. Made from the very best materials, all parts are standardised and machined to gauged limits to ensure perfect movement. The sets are produced in two sizes — for mortice 6 in. × 1¾ in. and for latch 3 in. × 1¾ in. Both are offered in a complete range of finishes on brass, gunmetal and aluminium bases.



LILLY

B. LILLY & SONS LTD · BALTIMORE RD · BIRMINGHAM 22B

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HIGGS AND HILL
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LONDON

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Flooring 'Standards' by **HOLLIS**

WOOD BLOCK · HARDWOOD STRIP · PARQUET FLOORS

SEASONING

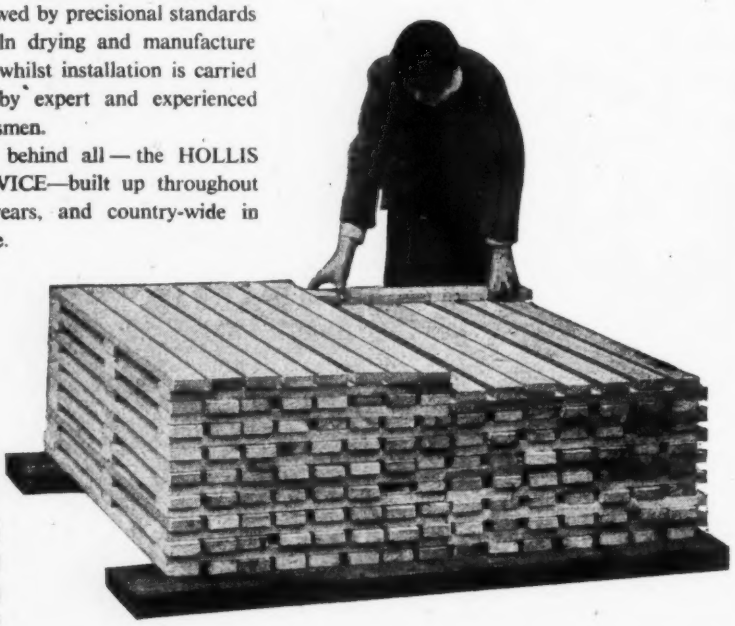
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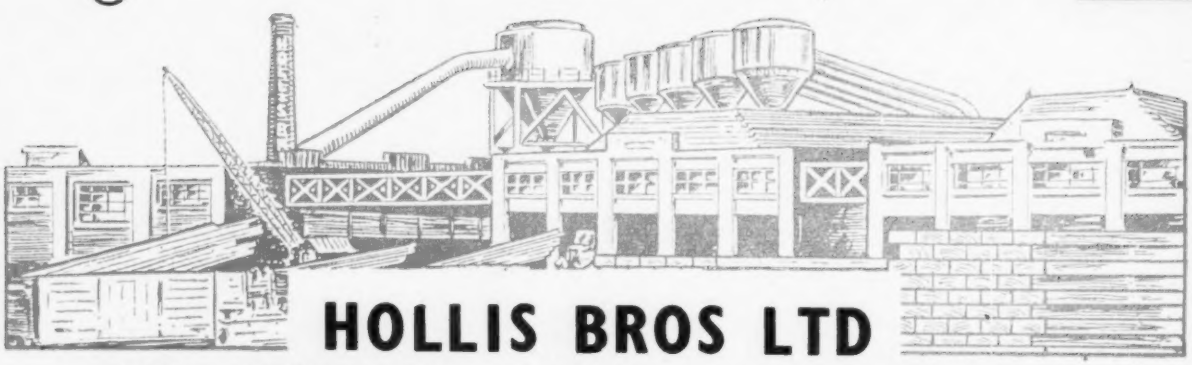
—*the key to stability in timber*

The stability of a building depends on its foundations—the stability of timber, upon seasoning. It may commence by 'girdling' standing trees. It may continue to a small degree in the log, but most important is seasoning after conversion Essential requirements for this are—solid foundations to piles, correct 'stickers' and careful building of stacks, to take advantage of drying winds.

The timber for HOLLIS floors is given the most meticulous attention at this initial stage. It is followed by precisional standards in kiln drying and manufacture . . . whilst installation is carried out by expert and experienced craftsmen.

And behind all — the HOLLIS SERVICE—built up throughout 60 years, and country-wide in scope.



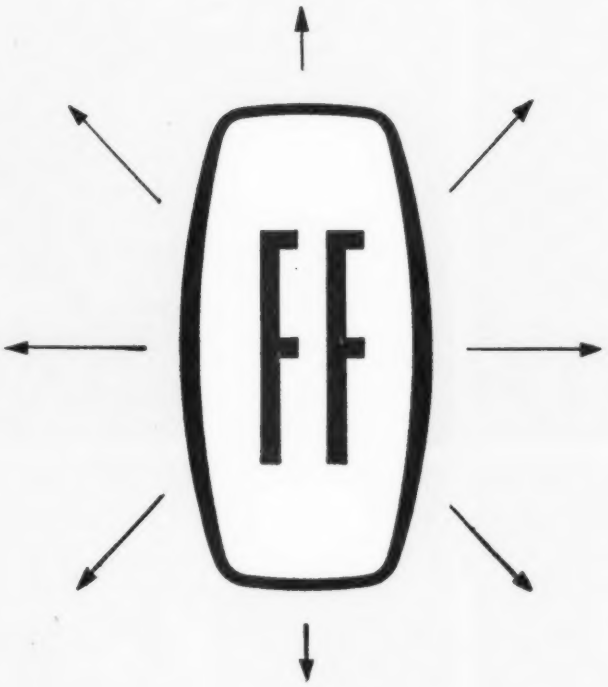


HOLLIS BROS LTD

HULL: CRAVEN HALL · LONDON: 150 HOLBORN · E.C.1
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Approved contractors for **SEMASTIC** decorative tiles *(Product of a Dunlop Company)*

T.A. 454



SERVITOR COOKER

ENSIGN COMBINATION GRATE

SOFONO LO-FRONT FIRE

SWIFT STAND-IN FIRE

SOFONO-SUNRAY HOMEHEATER

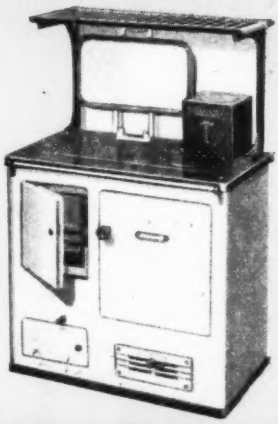
SOFONO CONVECTOR FIRE

FF

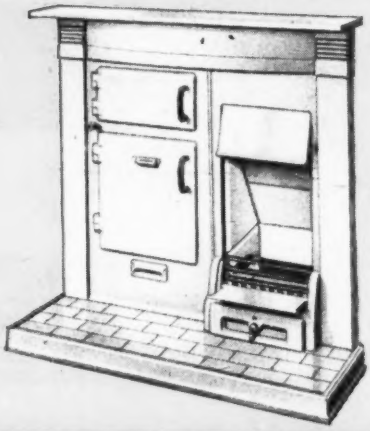
GRANGE-CAMELON IRON COMPANY LIMITED, FALKIRK
A FEDERATED FOUNDRIES COMPANY



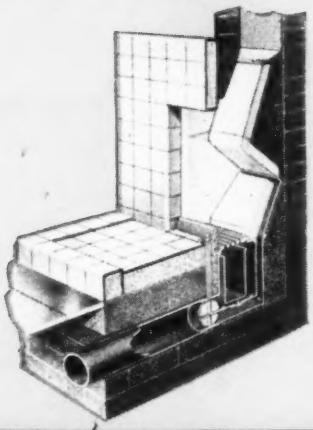
THE SOFONO COOKER
F.S. Open Fire Cooker and Waterheater.



THE SERVITOR COOKER
Fully insulated F.S. Cooker and Waterheater.



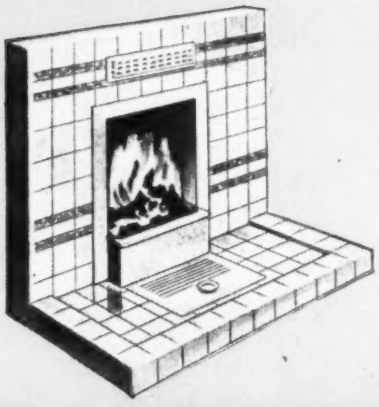
THE ENSIGN Combination Grate
Inset Cooker with patent all night burning fire.



SUMMIT Fire
Underfloor air fire which converts smoke to flame.



SOFONO Convector Fire
Ducts take warmed air from the fire to 2/3 rooms.



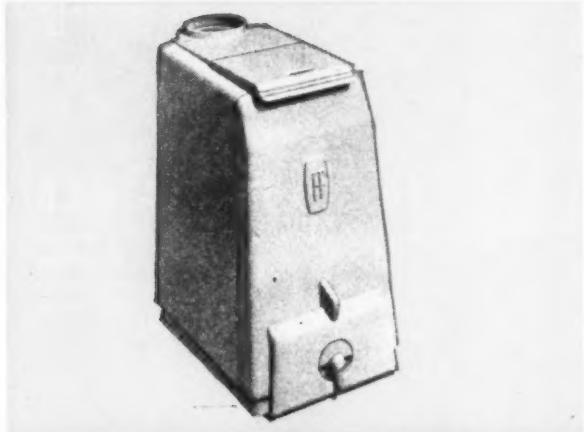
CAMELON Convector Fire
2 types — under and over-floor air models.



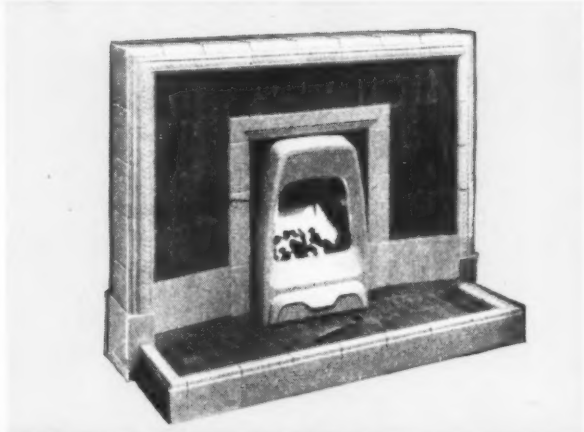
SOFONO-SUNRAY Homeheater
A contemporary appliance, free standing or inset.



SOFONO Stove Nos. 3, 4 & 5
Closed stove with convection side panels optional.



SOFONO Stove Nos. 1 & 2
An inexpensive all-purpose stove in 2 sizes.



SWIFT Stand-In Fire
Fully open fire with advantages of a closed stove.

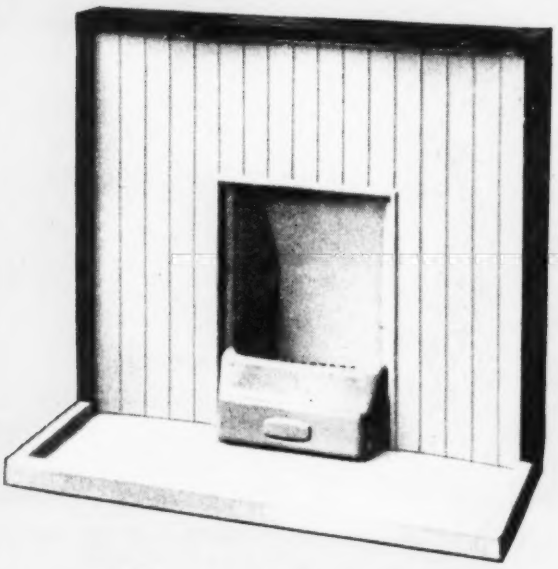
DISPLAY AND ADVERTISING MATERIAL

To help your sales, a variety of attractive display material is available on request to our local representative or Head Office in Falkirk. The display material includes Electric Liquid Light signs, window showcards and bills in addition to leaflets.

For your own press or catalogue advertising, electros or stereos of the appliances are available on loan.

GRANGE-CAMELON IRON COMPANY LIMITED, FALKIRK
A FEDERATED FOUNDRIES COMPANY

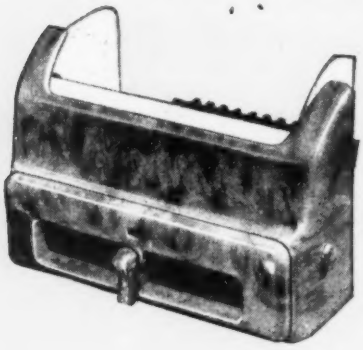
THE POPULAR RANGE OF SOFONO FIRES



1

① SOFONO LO-FRONT with SURROUND

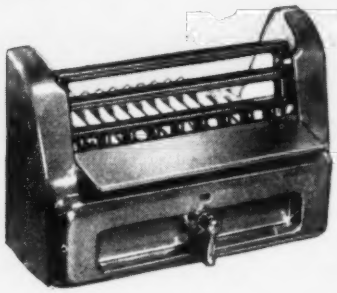
Illustration shows the Lo-Front Fire fitted into the new vitreous enamel surround. The Lo-Front Fire is in 4 sizes, 12", 14", 16", 18".
The Surround, which is available in five colours, is completely suitable for installation with any type of 16" Sofono Fire.



2

② SOFONO ORIGINAL

The famous all night burning fire in 12", 14", 16", 18" sizes to fit most fireplaces. All Sofono Fires are available in a wide variety of colours in lustrous or vitreous enamels.



3

③ SOFONO DROP-FRONT

This popular model, also continuous burning, gives excellent radiation into the room and the novel drop front can also serve as a trivet. In sizes 14", 16", 18".

FF

GRANGE-CAMELON IRON COMPANY LIMITED, FALKIRK
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structural steelwork

Steel Structures of all types are designed, fabricated and erected by Wards — a constructional engineering service backed by half-a-century's experience and all the facilities to carry out projects of any magnitude.



THOS W. WARD LTD

ALBION WORKS · SHEFFIELD

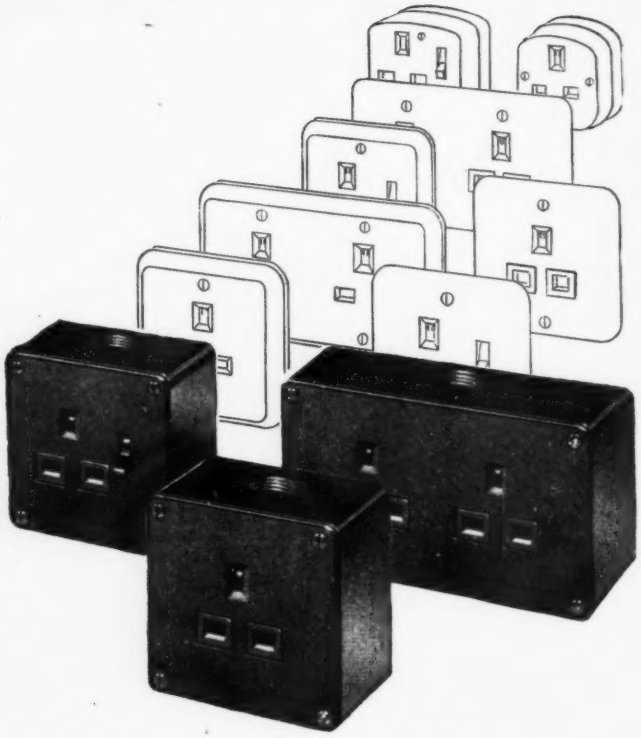
'Phone 26311 (22 lines). 'Grams 'Forward Sheffield'

LONDON OFFICE: BRETTENHAM HOUSE · LANCASTER PLACE · STRAND · W.C.2

CS.15



ELEVEN NEW SOCKET-OUTLETS FOR THE STANDARD PLUG



IRONCLAD UNITS FOR ROUGH USAGE

The new easily-wired Crabtree metalclad units have the rugged strength of steel and cast iron and can be installed with confidence wherever extra-rough usage is to be expected. There are three patterns: a single, a twin and a switched socket-outlet. In all patterns, nylon has been used for the shutter-operating cams and this strong, resilient, virtually unbreakable material has also been used for the dollies of the switched patterns. You can rely on Crabtree metalclad socket-outlets.

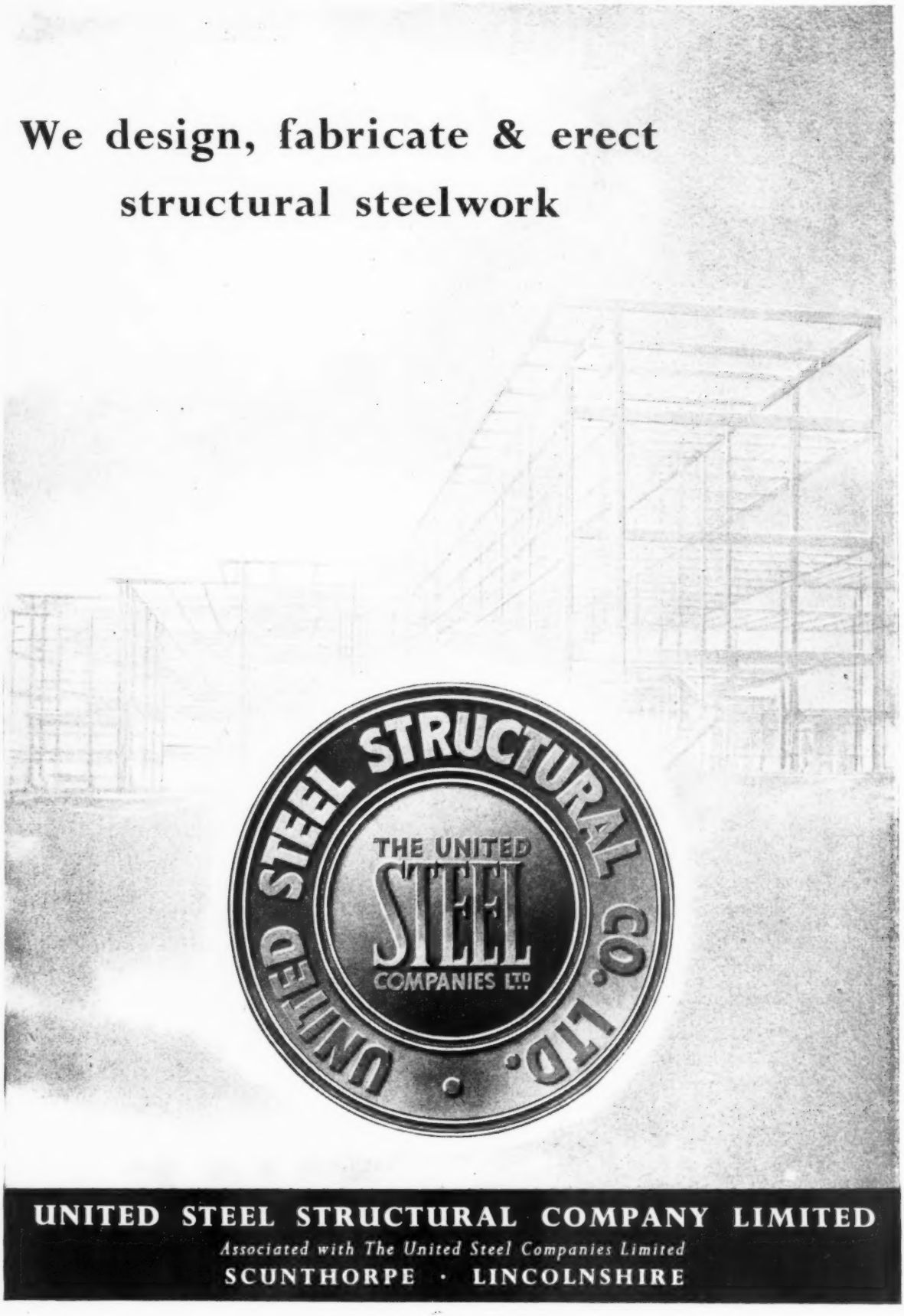
CRABTREE

WIRING ACCESSORIES • SWITCHGEAR • MOTOR STARTERS

"Crabtree" (Registered)

C.719/ Advt. of J. A. Crabtree & Co. Ltd., Lincoln Works, Walsall, Staffs.

We design, fabricate & erect structural steelwork



UNITED STEEL STRUCTURAL COMPANY LIMITED

Associated with The United Steel Companies Limited

SCUNTHORPE · LINCOLNSHIRE

a fitting of distinction...



F41041

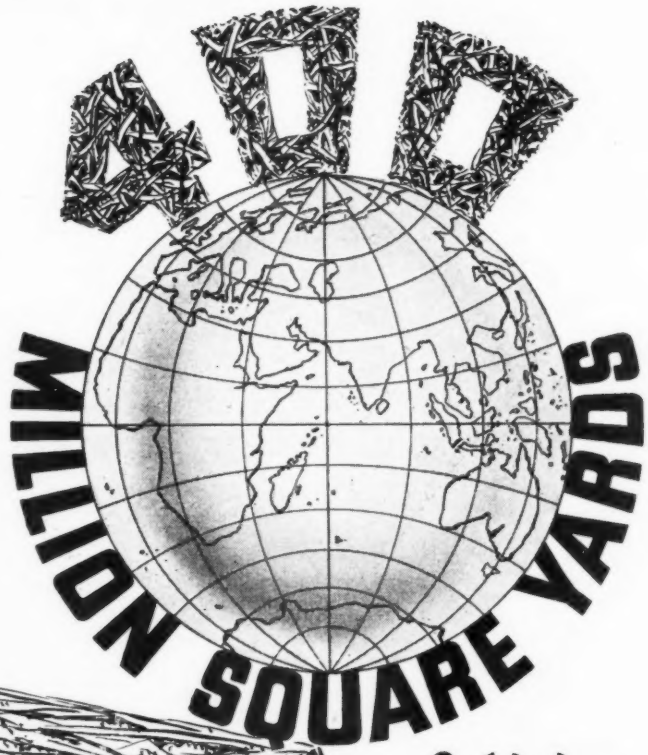
Twin 80 watt reeded perspex enclosed fitting, with moulded end caps in cream plastic. For ceiling or pendant mounting. Complete with 220/250v. instant start control gear.

£28 . 2 . 8

Purchase Tax £3 . 11 . 9 extra.

Osram tubes extra.

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2





Sold throughout the World over the last 30 years.

available in lengths as specified — guaranteed uniform thickness.

The only building slab bound with magnesite cement.

* Tough and resilient texture.
* Exceptional thermal insulation with high sound absorption.
* Non-brittle—not liable to crumbling.
* Non-combustible—highly fire resistant.
* Prompt delivery—in any quantity.

M.S. channel re-inforced edges.

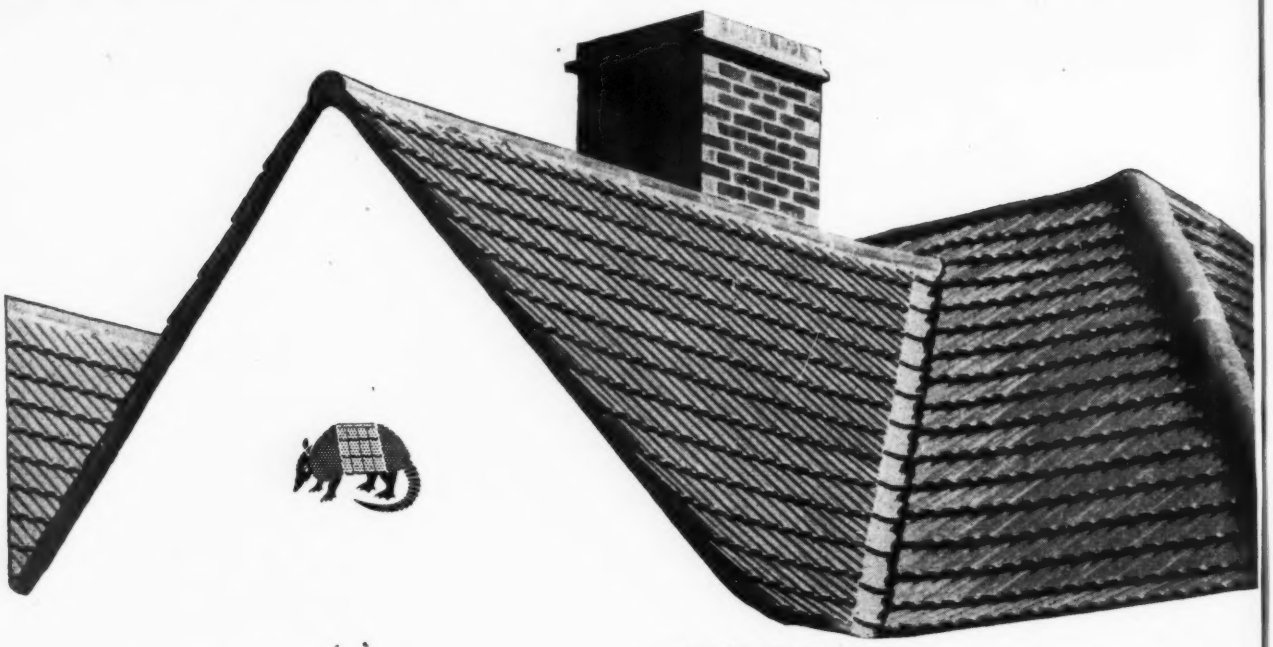
*Performance figures in excess of requirements for BS.*1105.

Ask also about Heracoustic Fine Fibre Acoustic Tiles.

Heraklith

Sole agents in U.K.:- **W. F. Schlesinger and Company Ltd.**
Capel House, 62, New Broad Street, LONDON, E.C.2. London Wall 7894

B/2247/B



Tiled with Redland '49' 15" x 9" interlocking tiles and using the Redland universal valley trough

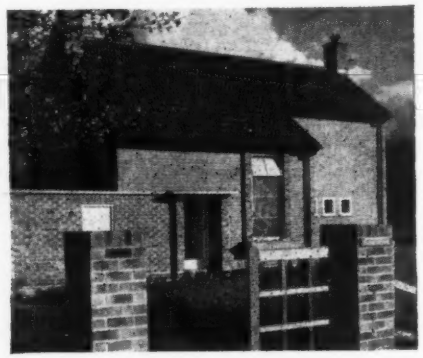
Redland '49'

Redland '49' — a fully interlocking, single-lap tile with a high reputation for strength and durability. Impermeable, surfaced with mineral granules, and supplied in a range of pleasing colours

Redland '50'

Redland '50' — roman pattern interlocking tile, for a good-looking roof at a moderate cost. It has the traditional charm of the double roman pattern plus the strength and impermeability of all Redland tiles

House for Mr. Briebach at Willaston, Cheshire, roofed with 'Redland 50' Antique tiles. Architect: A. Stanley Barnes, Dip. Arch. (L'pool), A.R.I.B.A.



Redland tiles

good—for 50 years and more

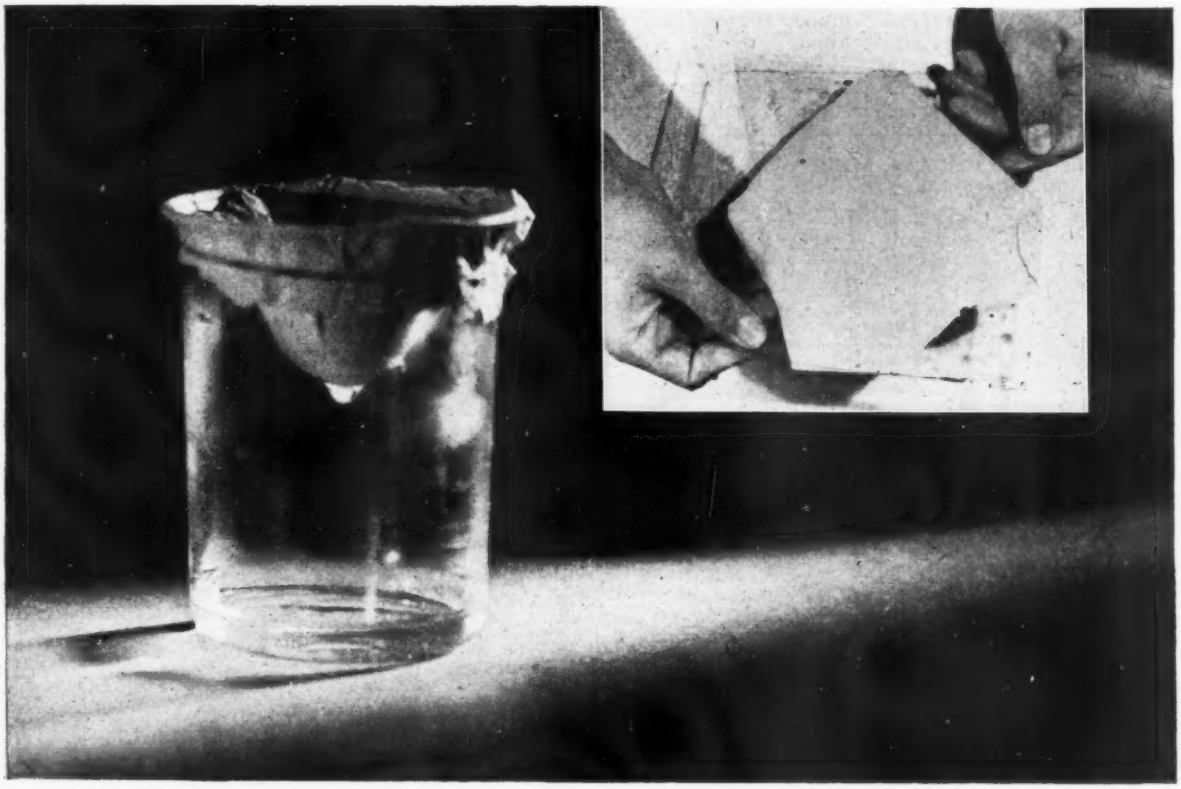
Redland Tiles Ltd **Moorhouse**
Nr Westerham Kent Tel: **Westerham 3206/9**

INSIDE STORY



GIVING IT THE WATER TREATMENT

This unusual test is designed to show the effect of water on Kinsheen Plastic Emulsion Paint. The main illustration shows a film of Kinsheen fixed above a beaker. It will be seen that water poured onto the paint is allowed to seep through. The smaller photograph shows the paint's surface completely unharmed by the experiment. This property is obviously a distinct advantage. It means that Kinsheen can be applied direct to newly set plaster. The porosity of Kinsheen allows the water to evaporate and the natural hardening of the plaster to continue. For details of the many other advantages of this remarkable paint and specifications, please write for literature or ask our representative to call.

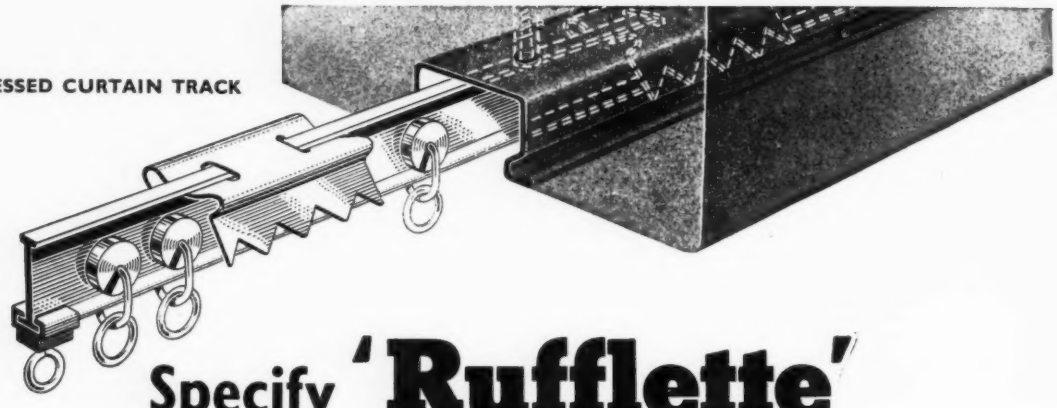


sanderson's KINGSTON paints

A. SANDERSON & CO. LTD., HULL.
Specialists in Fine Paints.

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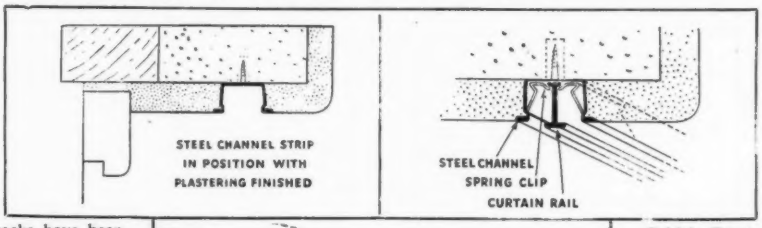
RECESSED CURTAIN TRACK



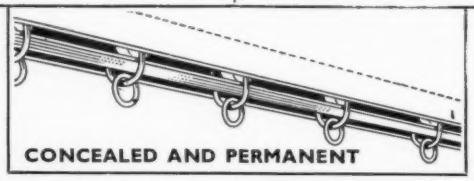
Specify 'Rufflette' (Pat. & Regd.) BRAND CURTAIN TRACK SYSTEMS

★ SEE OUR PERMANENT EXHIBITS
AT THE BUILDING CENTRE IN LONDON & GLASGOW

" Rufflette " Brand Recessed Curtain Track represents the perfect method of curtain suspension, being concealed, permanent and inexpensive. It is an integral part of the structure and can be fitted into wood or plaster lintels. The track is locked in position by a patent spring clip without screws. Many architects specify this product in new buildings.

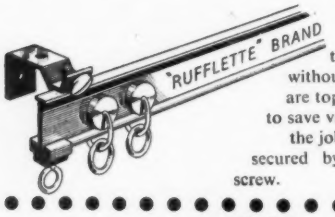


" Rufflette " Brand Tracks have been installed by many local authorities including Ilford, Wandsworth, Lewisham, Willesden, Finchley, Wood Green, Poplar, Wimbledon, Greenwich, Stoke Newington, Islington, Holborn, Leyton & West Ham Borough Councils. Also London, Bucks, Surrey, Middlesex & Essex County Councils.



CONCEALED AND PERMANENT

Cubicle Track installations have been made for many hospitals including Edgware Gen., Mount Vernon, Richmond, Bushey Maternity, Northwood & Pinner Gen., Liverpool Stanley East Suffolk & Ipswich, Southmead Bristol, Newcastle Gen., Darlington, Warrington Infy., and the Liverpool Royal Infy., and also for many municipal undertakings.

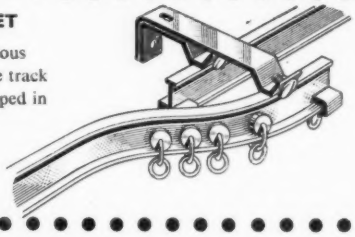


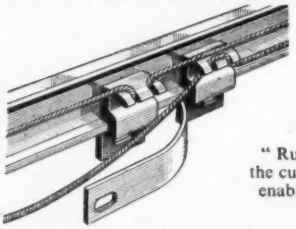
B/L TYPE TRACK

A strong track for all types of window, with or without cord control. Brackets are top or face fixing, designed to save valuable time and cost on the job, the track being rigidly secured by a single front-facing screw.

OVERLAP BRACKET

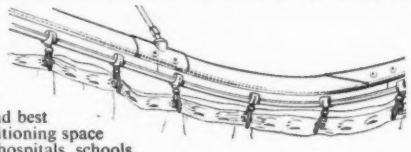
In order to give a generous overlap for curtains, the track can be cut and over-lapped in the centre, using the special BL7 bracket.





CORD CONTROL

On straight track curtains can be effortlessly opened and closed with this " Rufflette " Cord Control. Note the curved travelling section which enables curtains to be overlapped without cutting the track.



CUBICLE TRACK

The simplest and best method of partitioning space by curtains, in hospitals, schools, hairdressing establishments, clinics and stores. Suspension is from ceiling or wall and silent runners make the operation of curtains almost inaudible.

FULLY ILLUSTRATED CATALOGUE WILL BE SENT ON REQUEST TO:—
THOMAS FRENCH & SONS LTD. HEAD OFFICE: CHESTER RD, MANCHESTER, 15.
Also at Wythenshawe and London, Associate Company in U.S.A.

TABLE 3 SWITCHES

General symbol for local switch when considered applicable	●
1-way switch	●
2-way switch	●
Intermediate switch	●
Pendant switch	
Pull switch	

TABLE 4 SOCKET OUTLETS

		Alternative
Socket outlet		
Switch socket outlet		
A reference may be given against the symbol thus: Current carrying capacity Reference as required	13	13
NOTE: Combinations of the above outlets and switch symbols may be used if required Example: Wall outlet & local switch		

TABLE 5 FIXED HEATING OUTLETS

Tubular heater NOTE: 1. Length to be to scale and also to be given in schedule. 2. The circle represents the position of connection to the fixed wiring. 3. N equals number of tubes in bank	N
Fixed radiator or heating panel NOTE: Details of equipment to be given in schedule	
Convection heater	
Electric unit heater	
Immersion heater	
Thermostat	
Immersion heater with incorporated thermostat	
Self contained electric water heater	
Humidistat	H

Electrodes : The conductors that convey an electric current into or out of a liquid or a gas.

Electro-Magnetic Induction : If an alternating current, or a direct current of varying strength, is passing through a conductor, then any other approximately parallel conductor in the vicinity will have an electro-motive force induced in it. If the ends of the latter conductor are joined to form a closed circuit, an electric current will be induced. In practice, the respective conductors usually take the form of coils of insulated wire. Electric generators, static transformers and induction motors depend upon electro-magnetic induction for their operation. The principle was discovered by Michael Faraday in the year 1831.

Electro-Motive Force (E.M.F.) : A difference in electrical potential that tends to cause an electric current to flow from the point of higher potential to the lower.

Feeder : A main cable supplying a system of distributing mains.

Fluorescent Lamp : A tubular Discharge Lamp internally coated with a powder that fluoresces under the action of the discharge, producing a white or coloured light.

Four Wire Distribution : The usual system of distribution employed on 3-phase A.C. systems ; it consists of three ' phase ' wires and one neutral wire.

Fuse : A safety device consisting of a few inches of relatively fine wire, mounted in a suitable holder and connected to part of an electrical circuit. If the current exceeds a predetermined value in amperes, the fuse wire melts (i.e. the fuse ' blows ') and thus obviates damage to the circuit that it protects. The blown fuse wire should only be replaced by another of suitable capacity.

Grid : The high voltage transmission system constructed and formerly operated by the Central Electricity Board.

High Voltage : Normally exceeds 650 volts.

Horse Power (H.P.) : The unit of rate of doing mechanical work. 1 kilowatt is equivalent to 1.34 H.P. when the efficiency of conversion is 100 per cent.

I.E.E. Regulations : The Regulations for the Electrical Equipment of Buildings, issued by the Institution of Electrical Engineers, which, though not mandatory, are the standard by which all electrical installations are judged and the basis of every trustworthy specification. They state the main requirements and precautions for ensuring satisfactory results, including safety from fire and shock, forming a recognised code to which everyone engaged in electrical work is expected to adhere.

Installation : ' Consumer's wiring installation ' means the consumer's wiring, together with any apparatus upon the premises connected or intended to be connected thereto.

Insulation : A non-conducting material such as rubber, plastic, china, glass, mica, air, etc., enclosing, surrounding or supporting a conductor.

Interlocking Switch Plug : A plug and socket so arranged that the plug cannot be inserted or withdrawn unless the switch is in the ' off ' position.

Kilowatt (kW) : 1,000 watts : A unit of electrical power. In the case of a D.C. supply or a single phase A.C. supply at unity power factor, the number of kilowatts is obtained by multiplying the pressure in volts by the current in amperes and dividing by 1,000, e.g. an electric fire taking 5 amperes at 200 volts will consume power at the rate of

$$\frac{5 \times 200}{1{,}000} = 1 \text{ kW}$$

In the case of single phase A.C. other than at unity power factor, the product of volts and amperes must be multiplied by the power factor. In the case of 3-phase A.C. the product of volts and amperes must also be multiplied by the square root of 3 (i.e. 1.73). Thus a 3-phase motor taking a current of 5 amperes at 400 volts at a power factor of 0.75 is consuming power at the rate of

$$\frac{400 \times 5 \times 1.73 \times 0.75}{1{,}000} = 2.6 \text{ kW}$$

Kilowatt-hour (kWh) : The amount of electricity consumed, as measured by kilowatts, multiplied by hours. A kilowatt-hour is commonly called a unit of electricity.

Kilovolt-ampere (kVA) : Applies to A.C. only. It is the product of the pressure in volts and the current in amperes divided by 1,000, and when multiplied by the power factor gives the power in kilowatts. Is sometimes called the ' apparent ' power and is used to describe the rating of a transformer or other A.C. equipment. To give an example, a 10-kVA, 200-volt single phase transformer would be fully loaded if used to supply a motor taking 50 amperes but if the power factor of the motor is only 0.6, the true power is only 6 kW and the consumption as registered by the meter if the motor is run for one hour, will be 6 units.

To be concluded in GS. 2.

For further details apply to

GS.1 British Electrical Development Association

2 Savoy Hill, London, W.C.2. Temple Bar 9434

GLOSSARY AND SYMBOLS

GLOSSARY OF TERMS

Definitions of electrical terms in general usage that may concern the architect are given below, and on GS.2, with brief explanations. The symbols are taken from British Standard 108: 1951, *Section* 19: *Location Symbols for Electrical Installations. They refer particularly to the* purpose *of the outlets and not specially to electrical apparatus.*

Alternating Current : The direction of flow of the electric current is reversed many times a second. The national standard frequency in this country is 50 cycles per second. A cycle contains two reversals, viz., from one direction to the opposite, and then back to the original direction.

Alternator : See ' Electric Generator '.

Ampere (often contracted to Amp.) : The unit of electric current. As an indication of the order of magnitude of this unit, a 2-kW electric radiator on a 240 volt circuit takes a current of 8.3 amperes. Minute currents, such as occur in certain radio circuits, are measured in milli-amps., 1,000 of which equal one amp.

British Thermal Unit (B.Th.U.) : The quantity of heat required to raise the temperature of 1 lb. of pure water one degree Fahrenheit. One Unit of Electricity contains the same amount of energy as 3,412 British Thermal Units.

Busbars: The main conductors connecting the various sections of panels of a switchboard.

Capacitor (formerly termed 'condenser'): An arrangement of conductors in the form of metal sheets or foil separated by a thin dielectric of paper or other insulating material. It provides what is known as electrical capacity and A.C. will flow through it. Capacitors are widely used in radio apparatus, also for radio interference suppression and power factor correction purposes.

Central Electricity Authority (C.E.A.) : The Electricity Supply Act of 1947, which brought the electric supply industry under national ownership, established a Central Authority to generate and transmit electricity to 14 Area Electricity Boards which in turn act as retailers and distributors of electricity to consumers.

By the Electricity Re-organisation (Scotland) Act 1954, the South West and South East Scotland Boards have since been transferred, together with the power stations in their areas, to the South of Scotland Electricity Board.

Circuit Breaker : An earth-leakage circuit breaker which will cut off the main supply as soon as an earth fault reaches a predetermined level is a sensible precaution in districts where dry conditions or other reasons make a low resistance earth connection difficult or unreliable.

Conductor : A substance that allows an electric current to pass relatively freely, i.e., has a high conductivity. Copper is a good conductor.

Current : The movement or ' flow ' of electricity ; usually measured in amperes.

Cut-out : A fuse such as the main fuse provided by the Electricity Board on a consumer's premises.

Dielectric : Insulation between two electrically charged bodies.

Direct Current (D.C.) — or Continuous Current : Current that flows continuously in the same direction.

Discharge Lamp : A lamp in which the current, passing through a mixture of gas and metallic vapour, forms a luminous electric discharge giving from 2½ to 5 times the light of a filament lamp of equivalent consumption. The light may be greenish (mercury) or yellow (sodium).

Distribution Main : The low voltage street main used for the general supply to consumers. These are usually fed from a high voltage feeder or ring main through a transformer in a substation and are either buried underground or carried overhead on poles.

Double Pole (D.P.) : A switch that opens and closes both the wires or ' poles ' of a circuit.

Diversity Factor : Any particular electrical appliance is spoken of as having a high or great diversity if among a group of these appliances, very few are in use simultaneously. If, say, 100 appliances, each loaded to 1 kW, produce a maximum demand of 20 kW, the diversity factor would be 1 in 5. It is the great diversity of domestic cooking and heating that enables Electricity Boards to quote low rates for general domestic use.

Earth, Earthing : Connection with the ground, i.e. the general mass of the earth, in such a manner that an immediate and safe discharge of energy is ensured at all times.

Electric Generator : A machine that converts mechanical energy into electrical energy. One that generates direct current is usually called a ' dynamo ' while one that generates alternating current is usually called an ' alternator '.

TABLE 1 CONTROL GEAR

Main control	
Main switch	
Change over switch	
Switchboard, distribution board, or fuseboard	
Contactor	
Meter	

TABLE 2 LIGHTING OUTLETS

Ceiling outlet lighting, filament lamp	
Wall outlet lighting, filament lamp	
Ceiling outlet for discharge lamp NOTE: When it is intended to use a tubular or other discharge lamp, reference should be made in the drawing or schedule to the exact location of the outlet in relation to lamp position, and also to the position of the ancillary apparatus	
Ballast unit, where installed remote from lamp fitting	
Power factor capacitor, where installed remote from lamp fitting	
Lighting outlet connected to an emergency system	
Exit box with wiring for normal and emergency systems	
Ceiling outlet for filament lamps with wiring connected to normal and emergency systems	
Ceiling outlet with wiring for filament and discharge lamps	
Ceiling outlet with wiring for discharge lamp connected to normal system, plus wiring for filament lamp connected to emergency system	
Street lighting standard	

GS.1

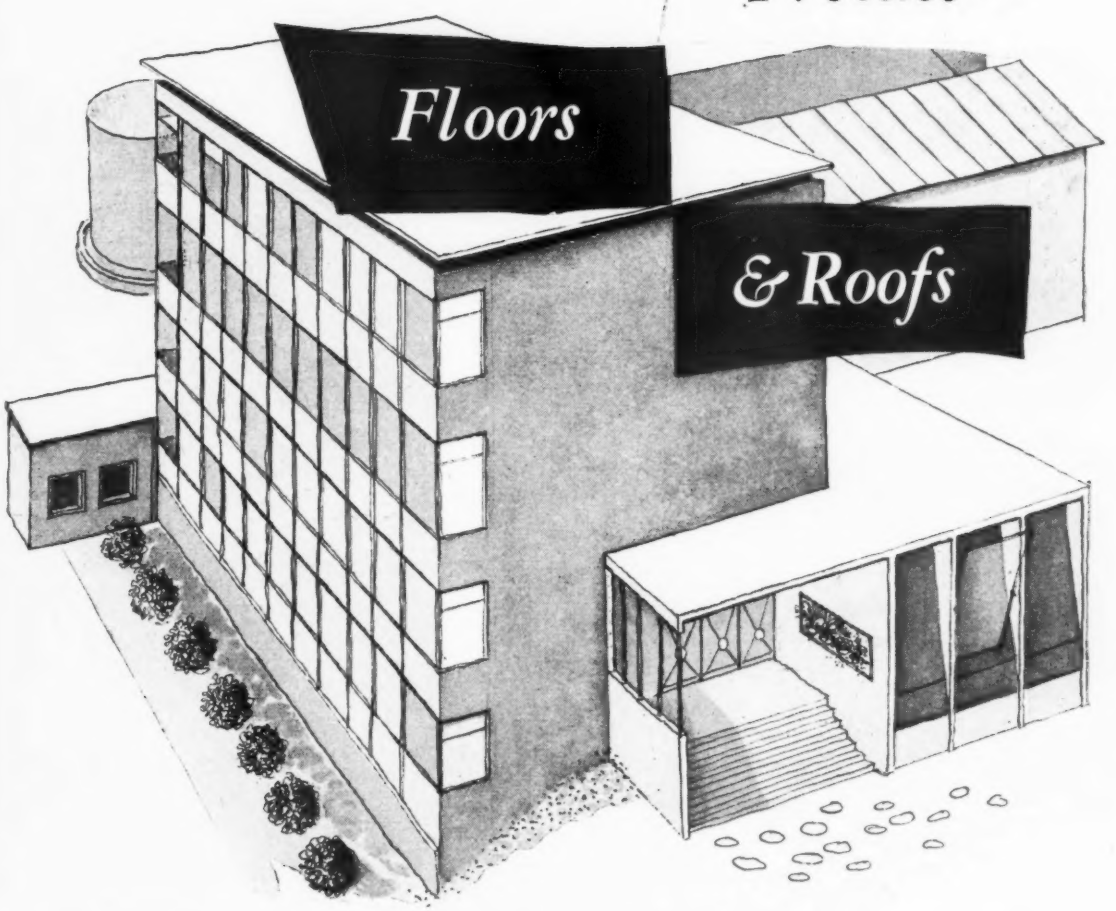


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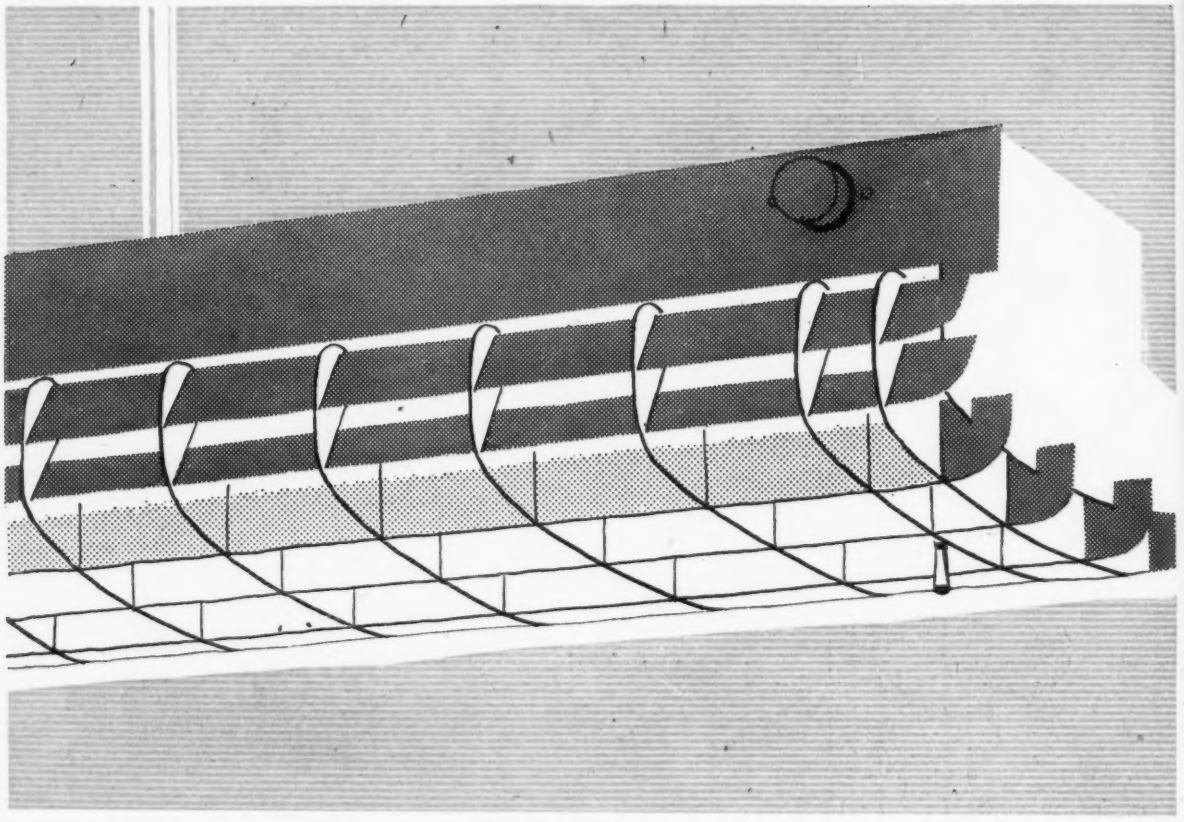
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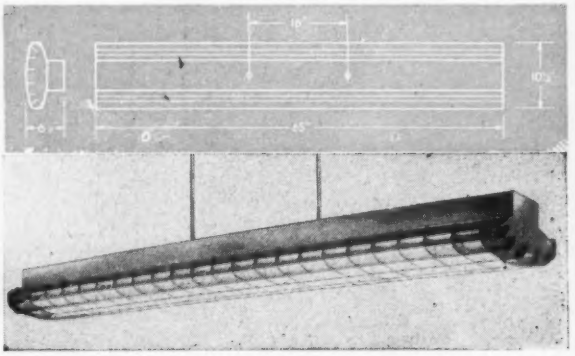
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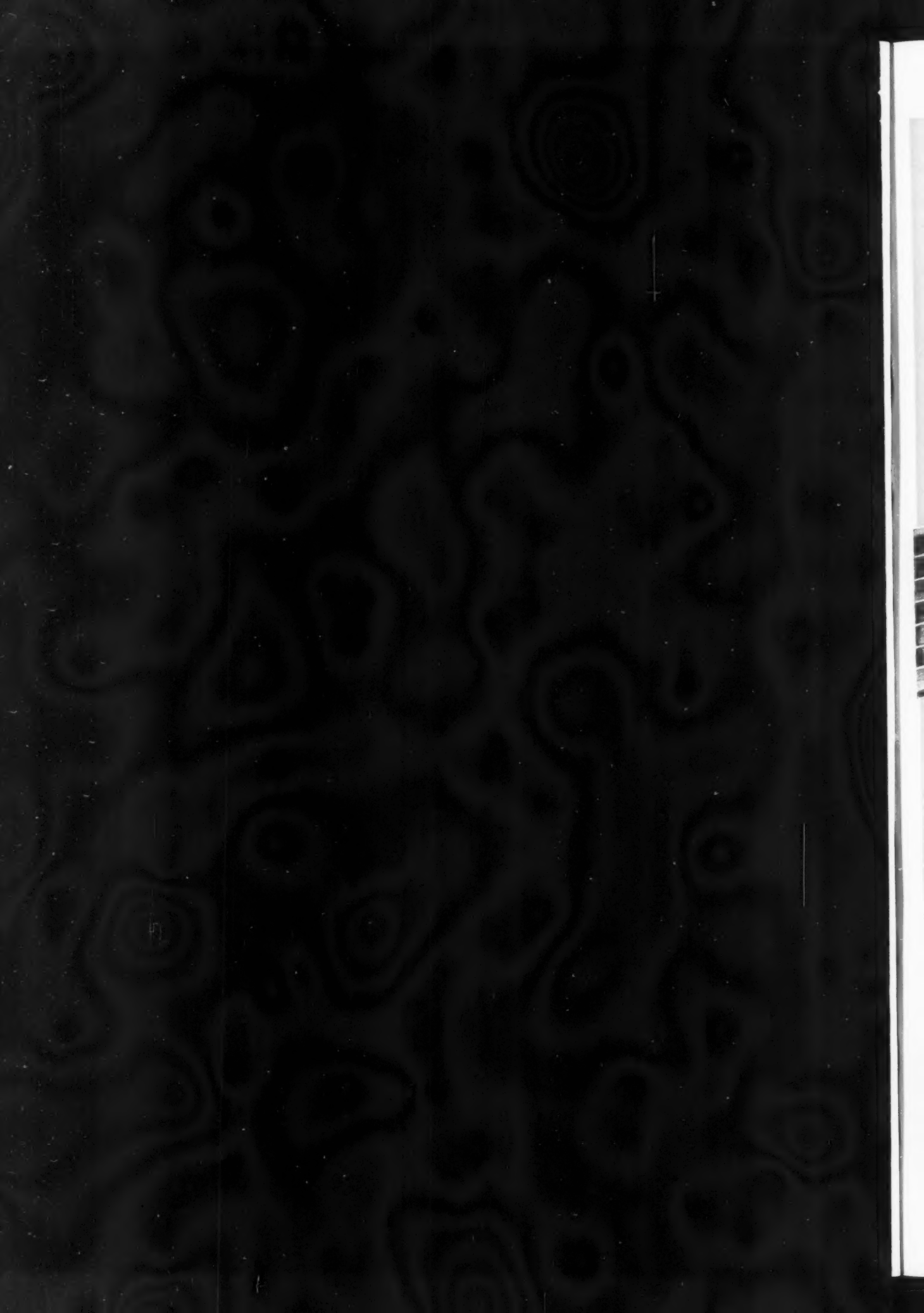


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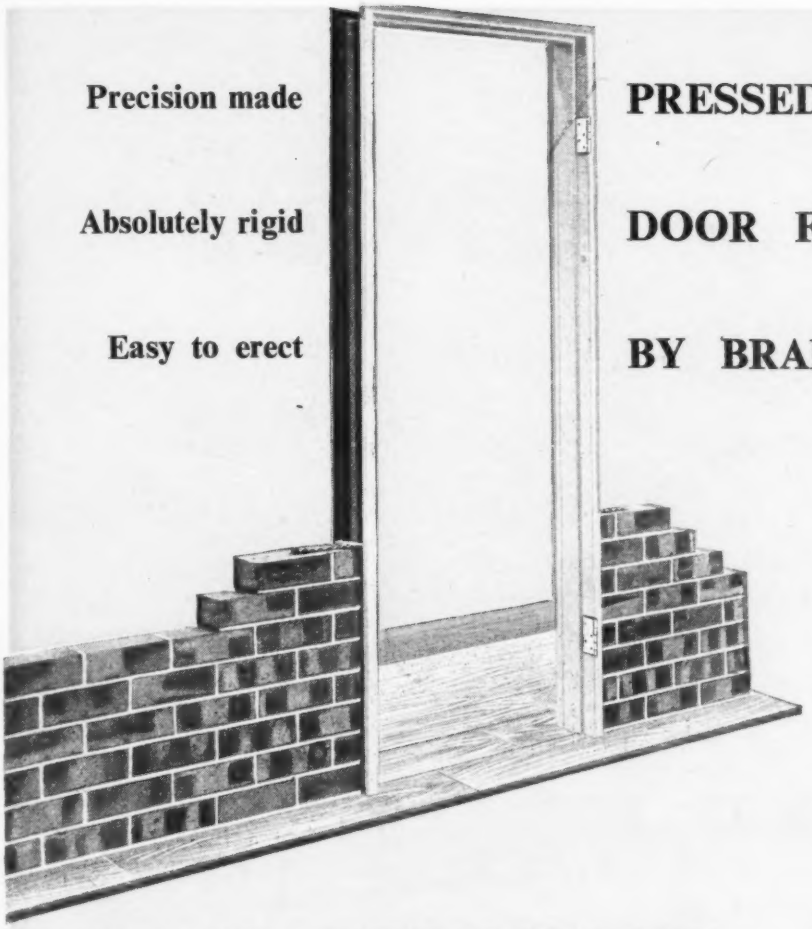


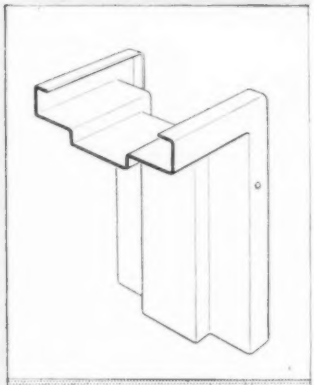
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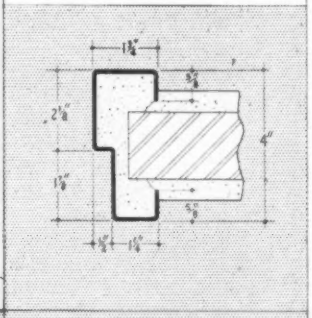
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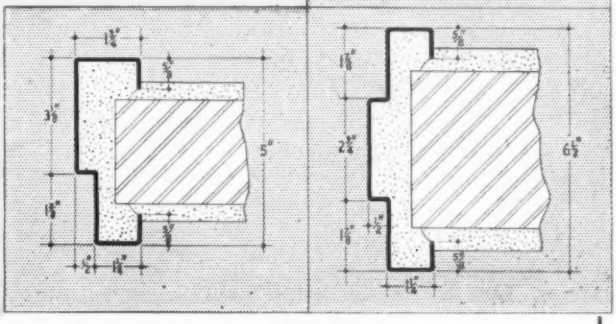
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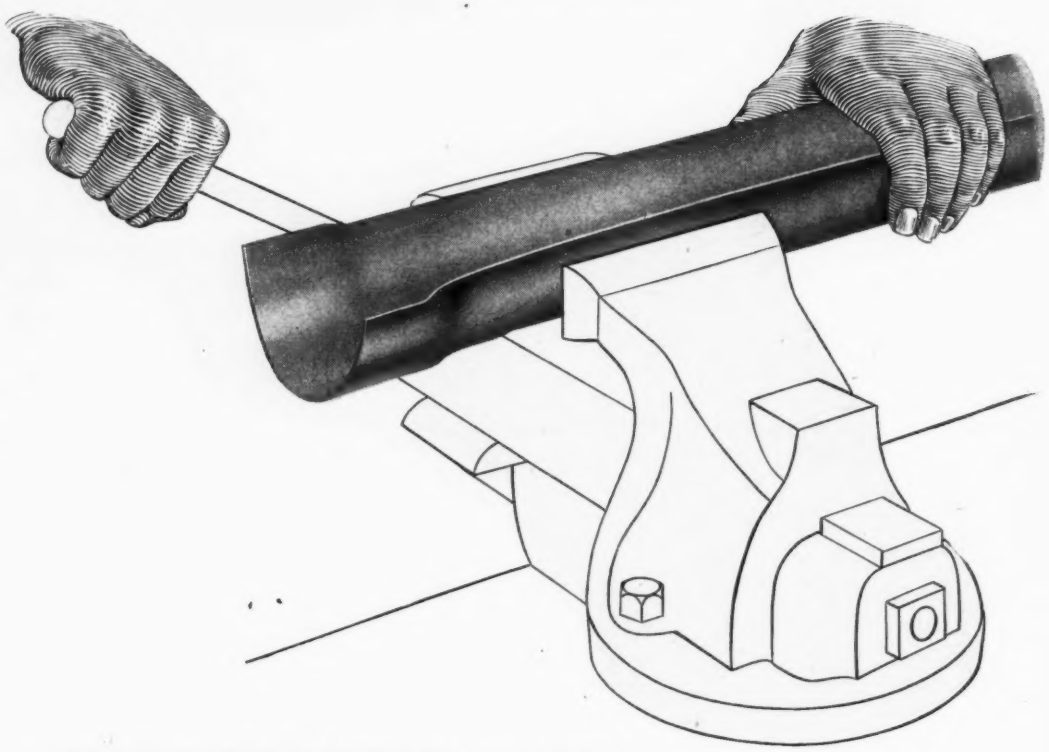
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PATENT GLAZING



Interior View of Factory

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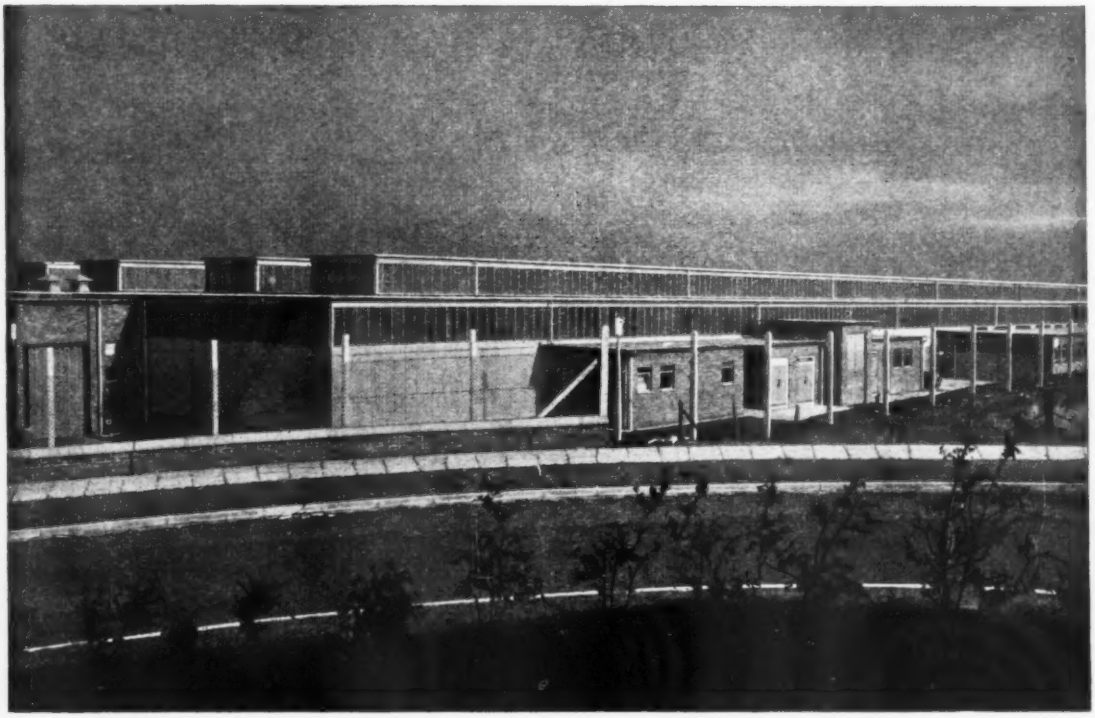
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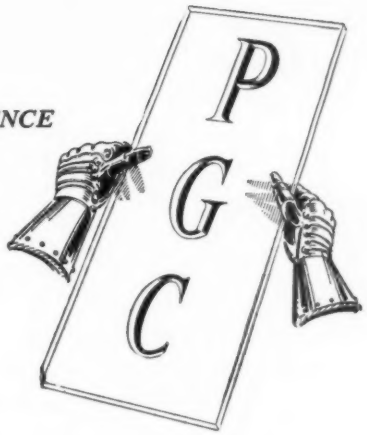
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External View of the Factory

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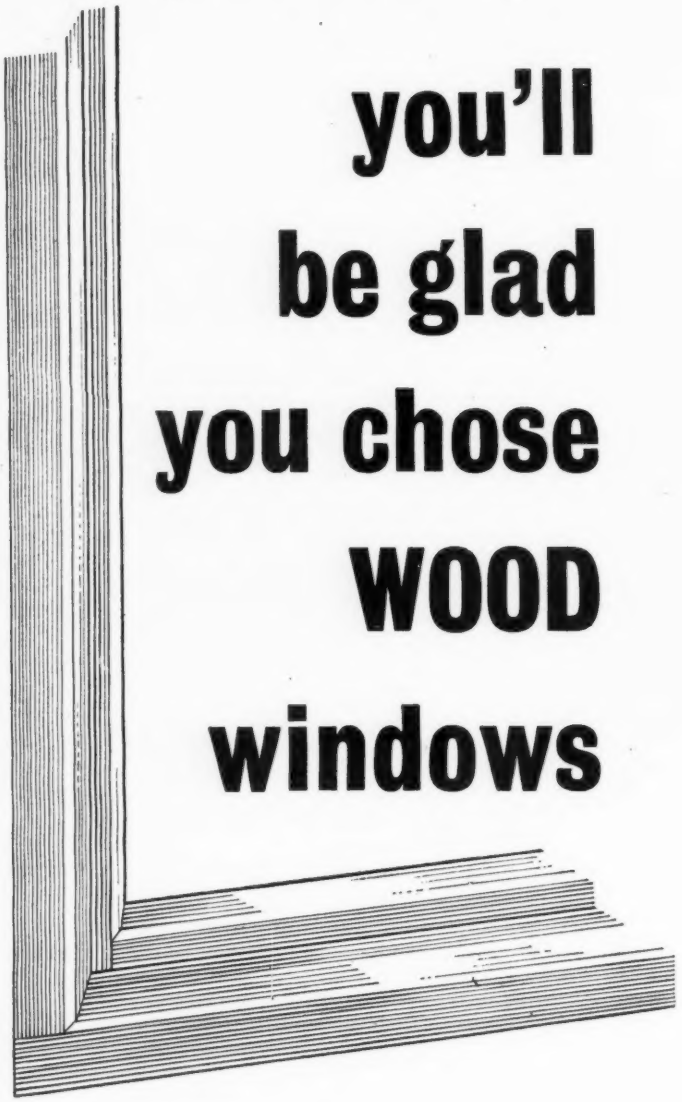
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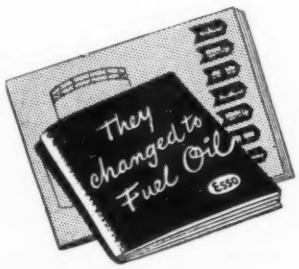
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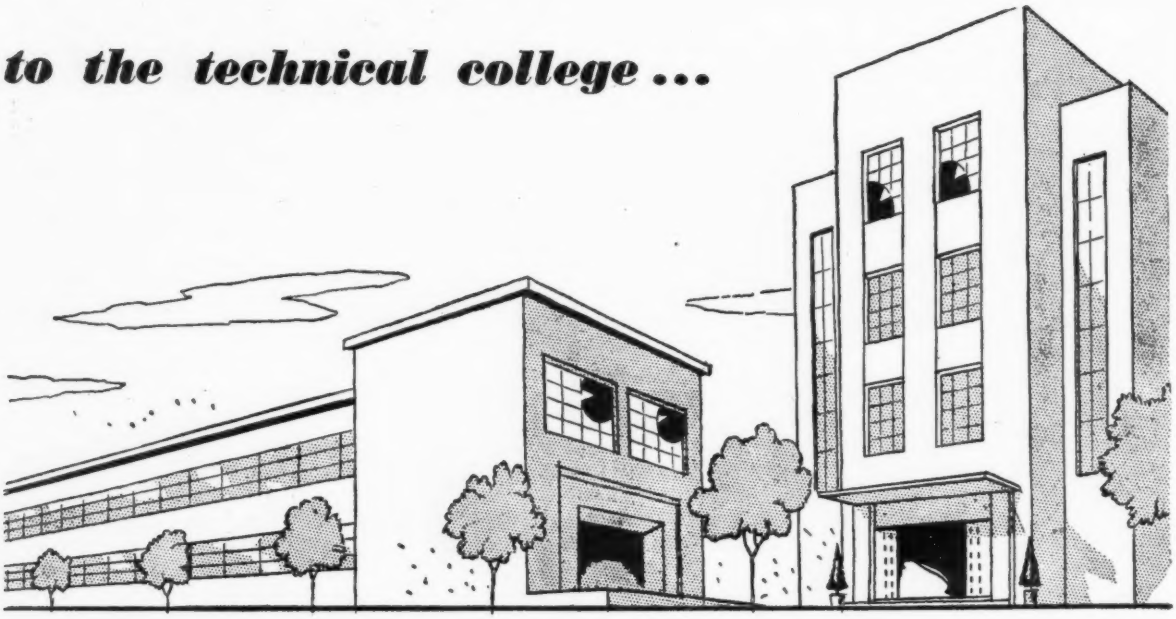
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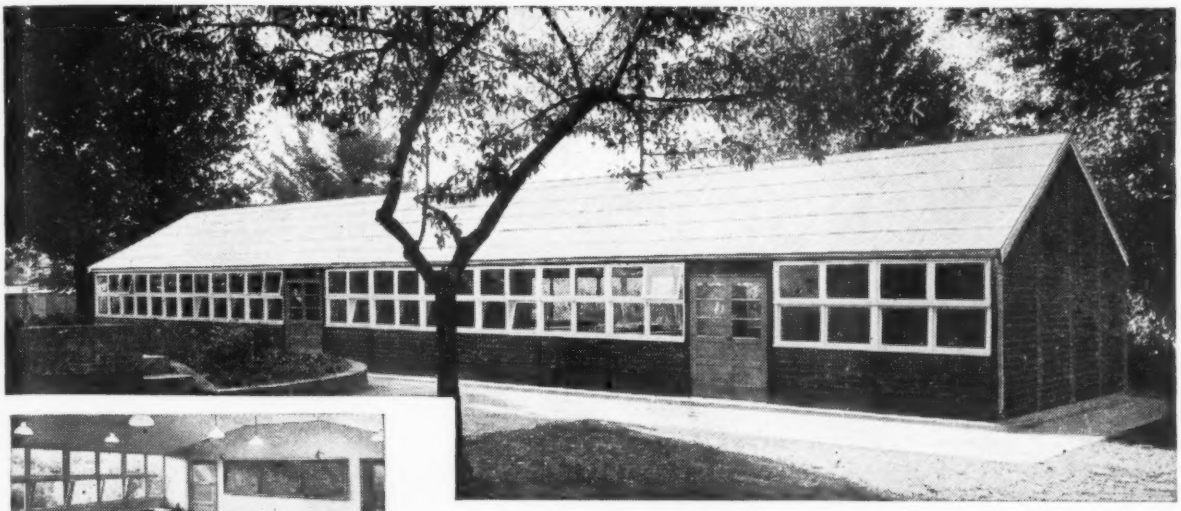
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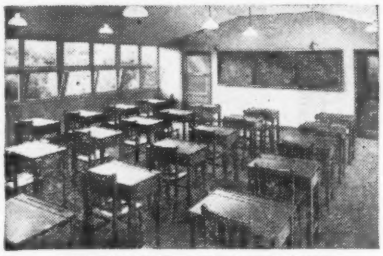
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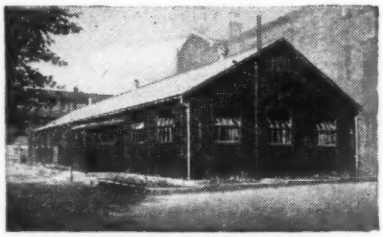
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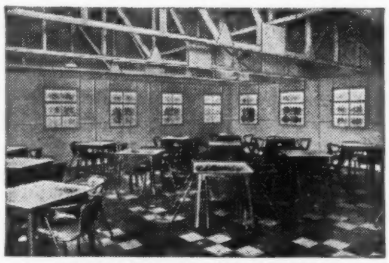




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SMITHS

Severely damaged by fire after enemy action on the 10th of May, 1941, part of the Atlas Assurance Head Office building has recently been restored. Happily the original architectural features were preserved, and an attractive arcade included. Smiths Clocks are a feature of the new offices, as will be seen in these illustrations.
Smiths Clocks are available in a wide range of interior and exterior models, or can be made to the Architect's design whenever desired.



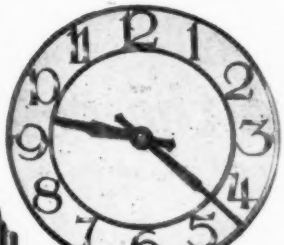
Main Entrance to Building



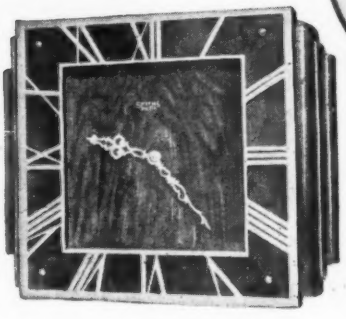
Main Entrance Hall



A General Office



JUPITER
Flush fixing Wall Clock with hand-cut circular fret zone. 12" dial. Bronze or gilt figures.

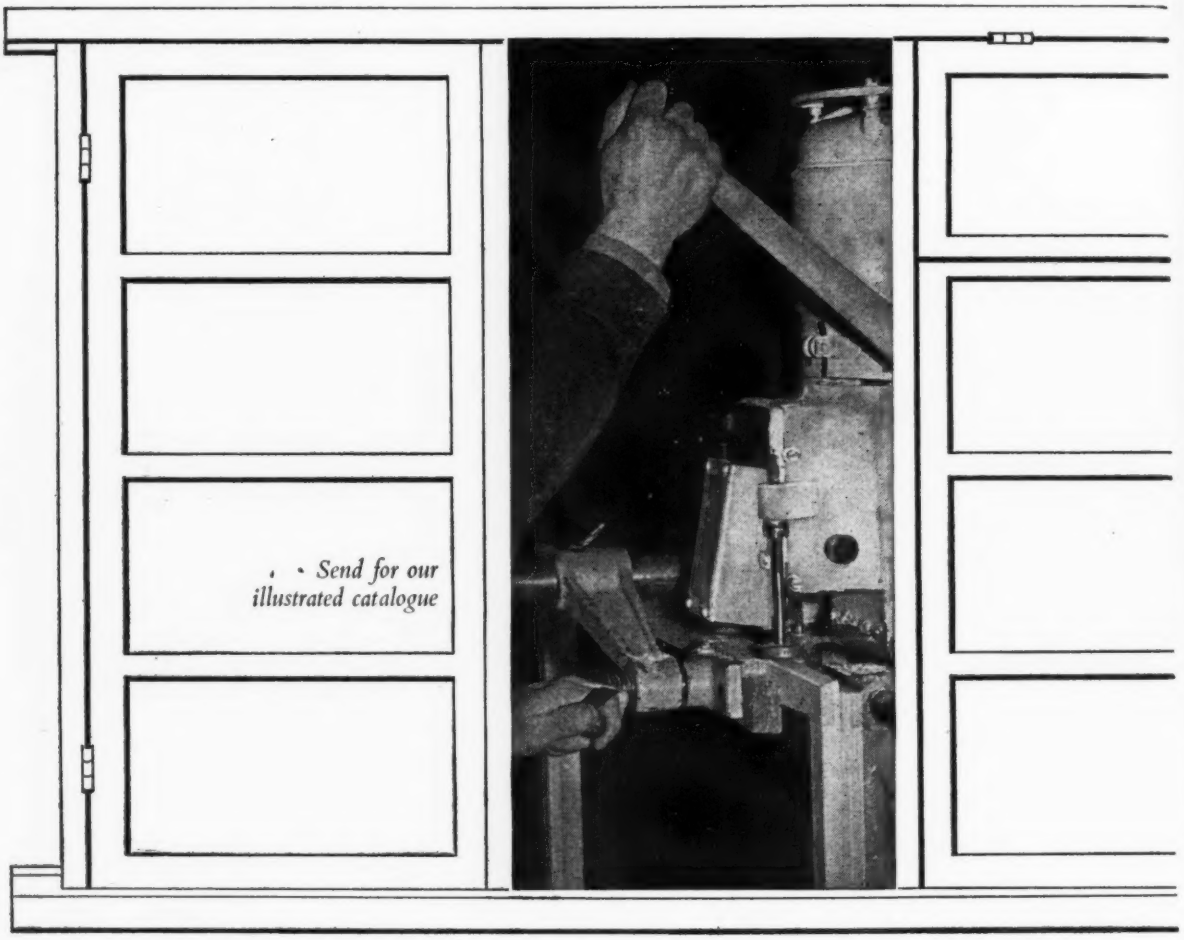


SHERBOURNE
Surface fixing Wall Clock Walnut finish case with gilt zone and hands. Plate glass front. H. 16" W. 20" D. 2½".



Ground Floor Office

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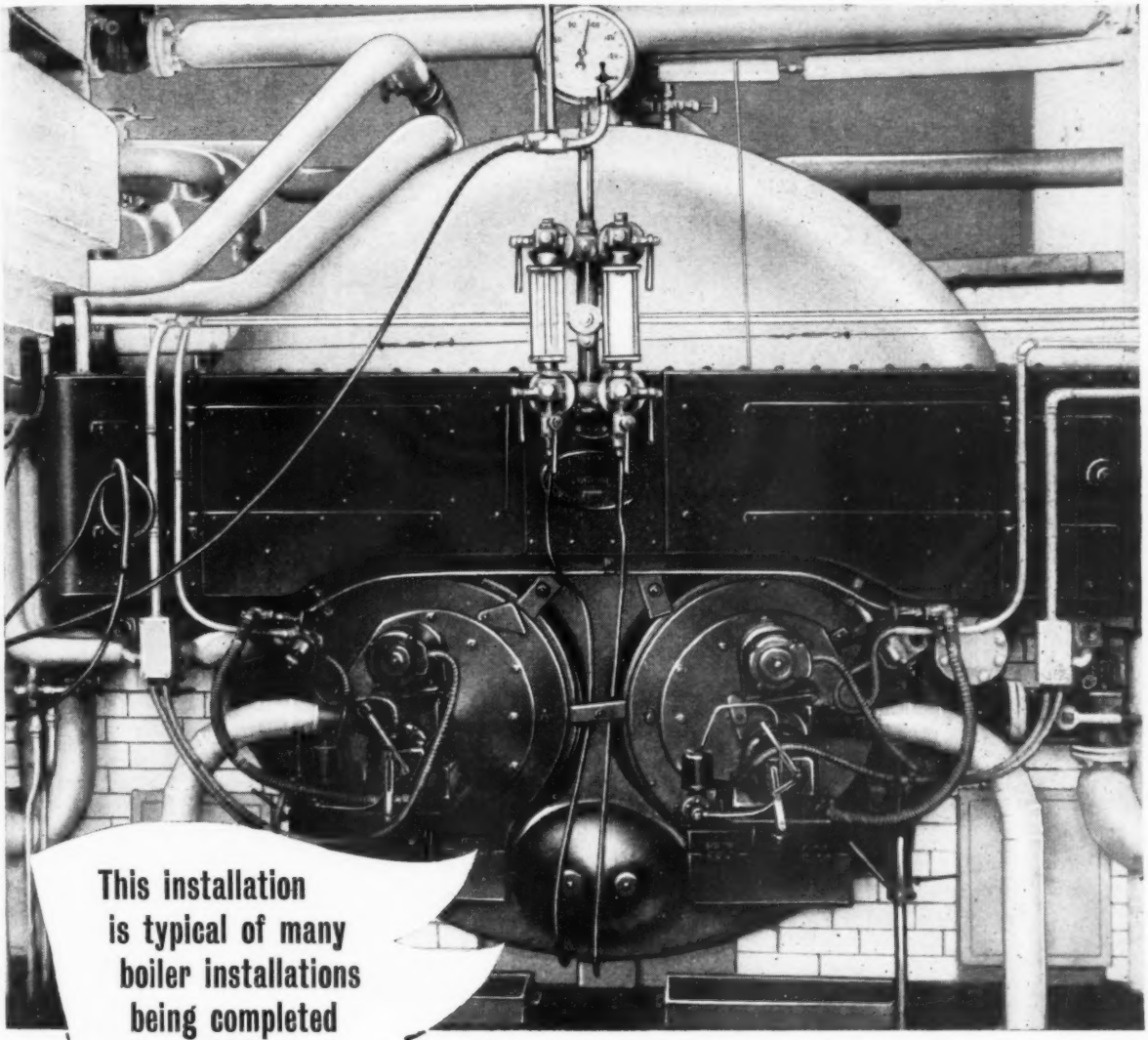
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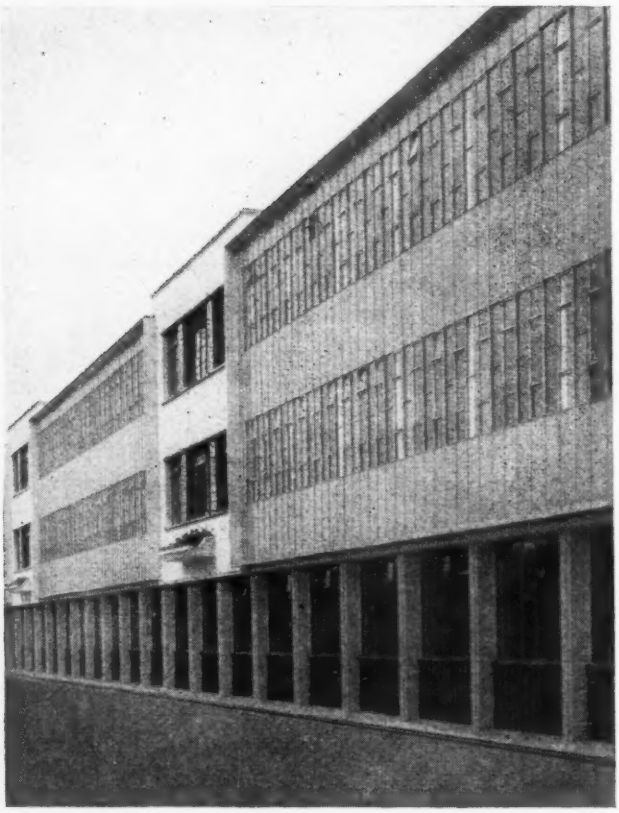
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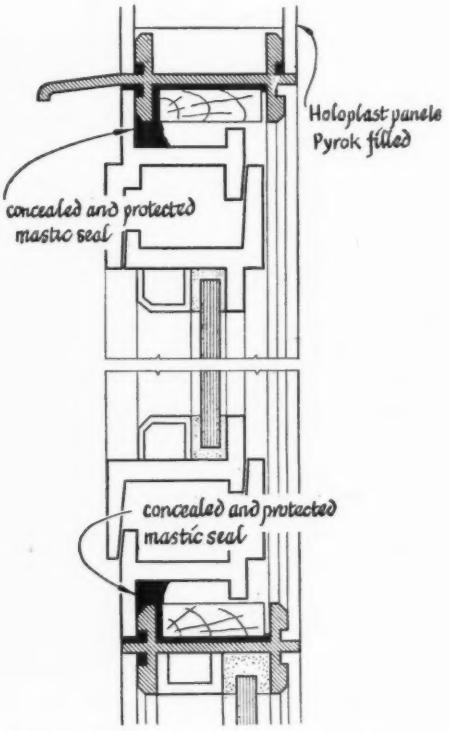
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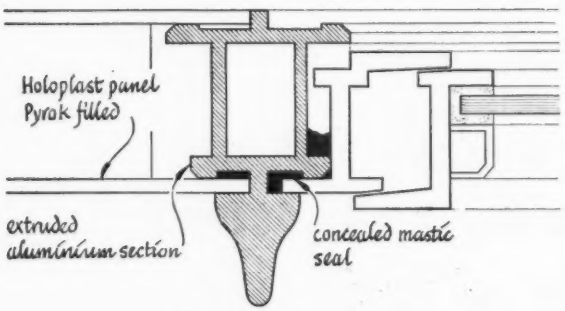


Typical vertical section showing use of specially designed aluminium sections

In the cladding of framed buildings

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provides lasting protection at the joints



Typical sectional plan

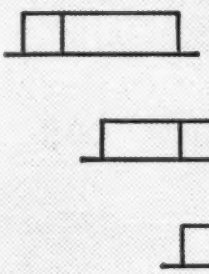
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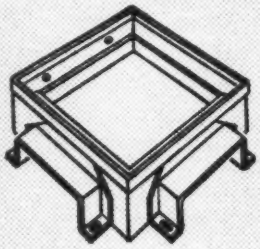


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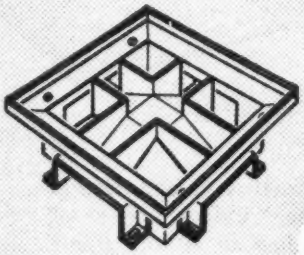
Sizes from 4"×1" to 12"×1½"

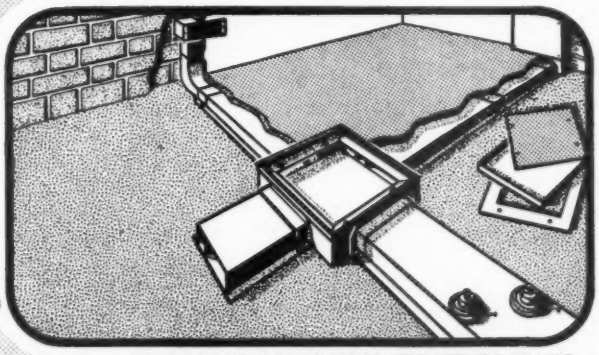
Single or multiple divisions

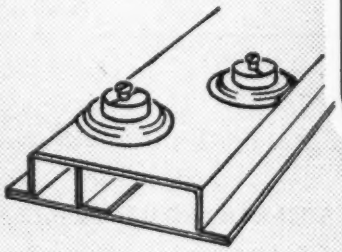
One-way or multi-way junction boxes

Flyover separators if required

Floor outlets for future connections







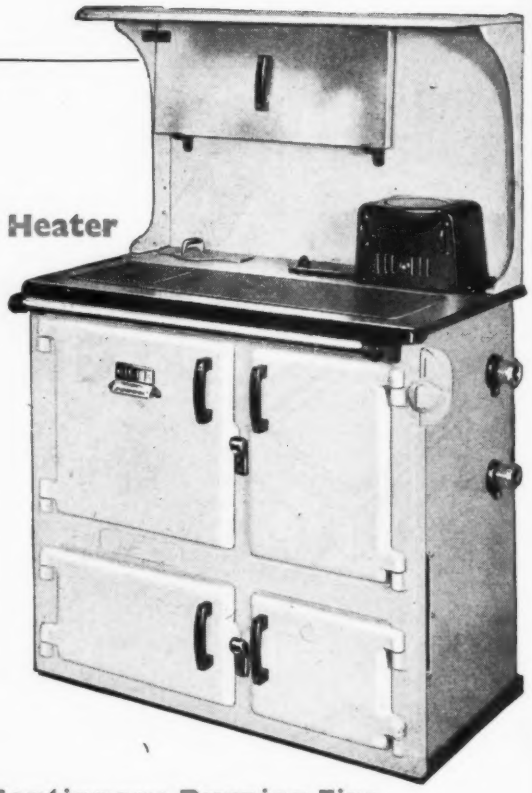
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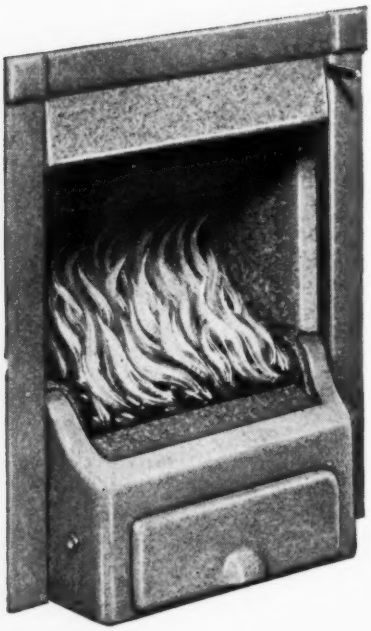
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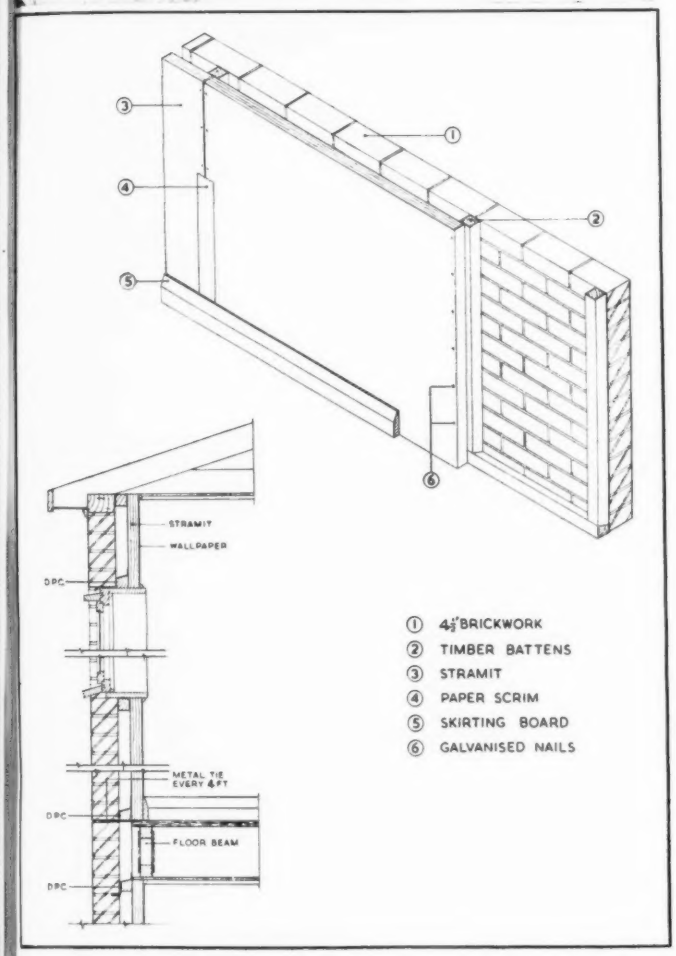
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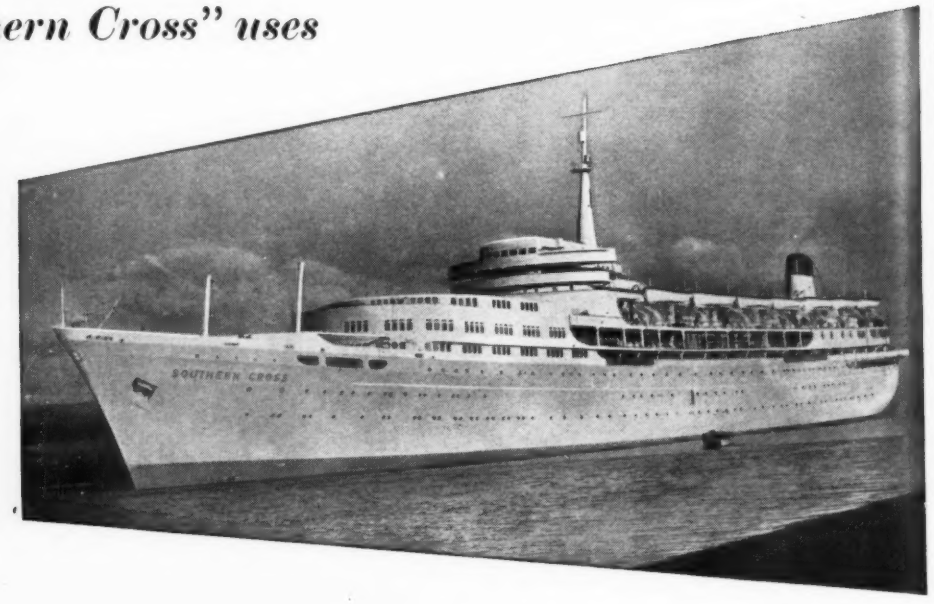
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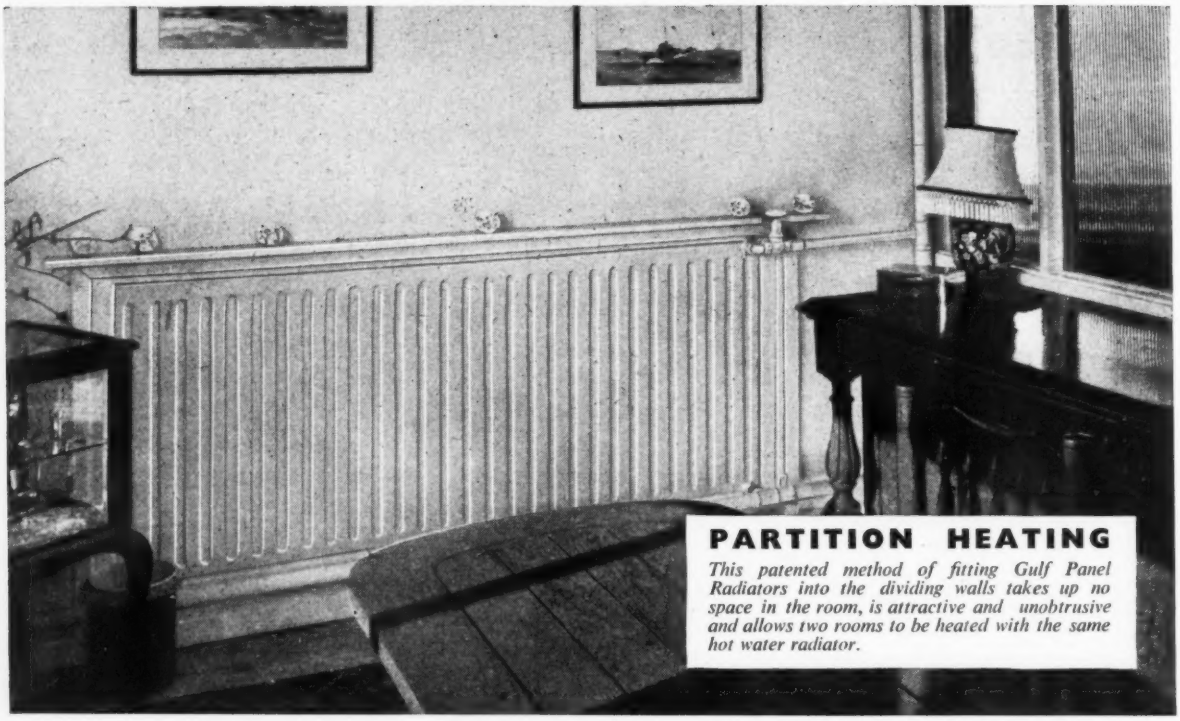
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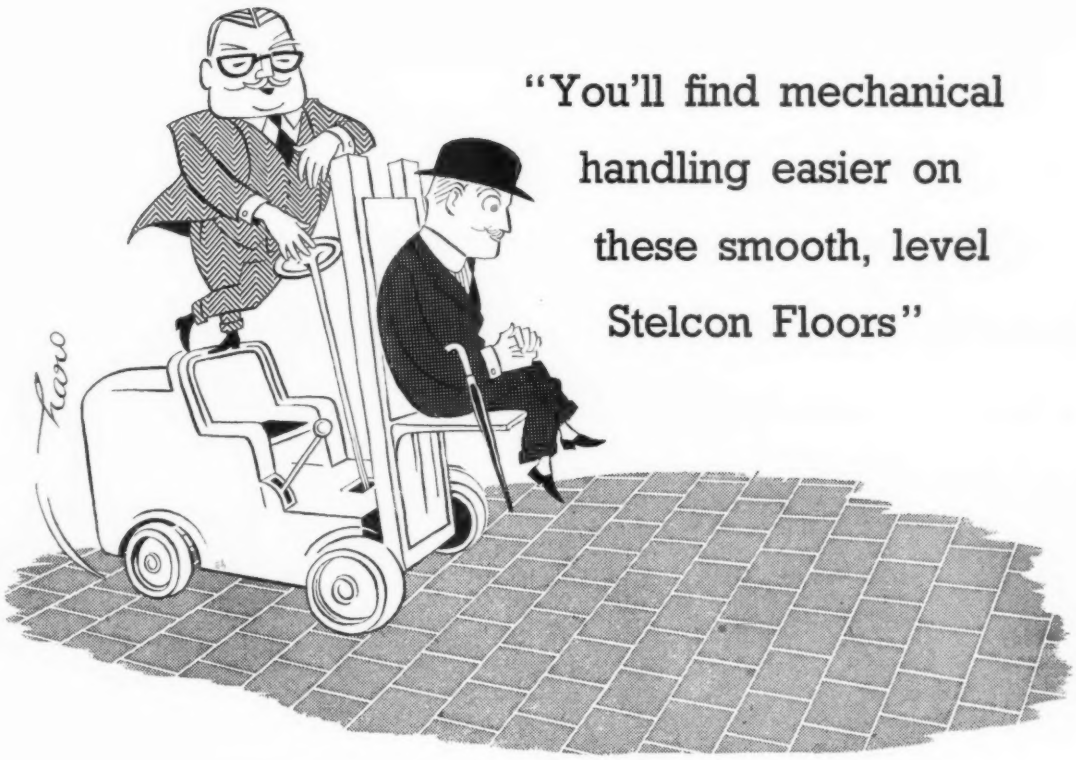
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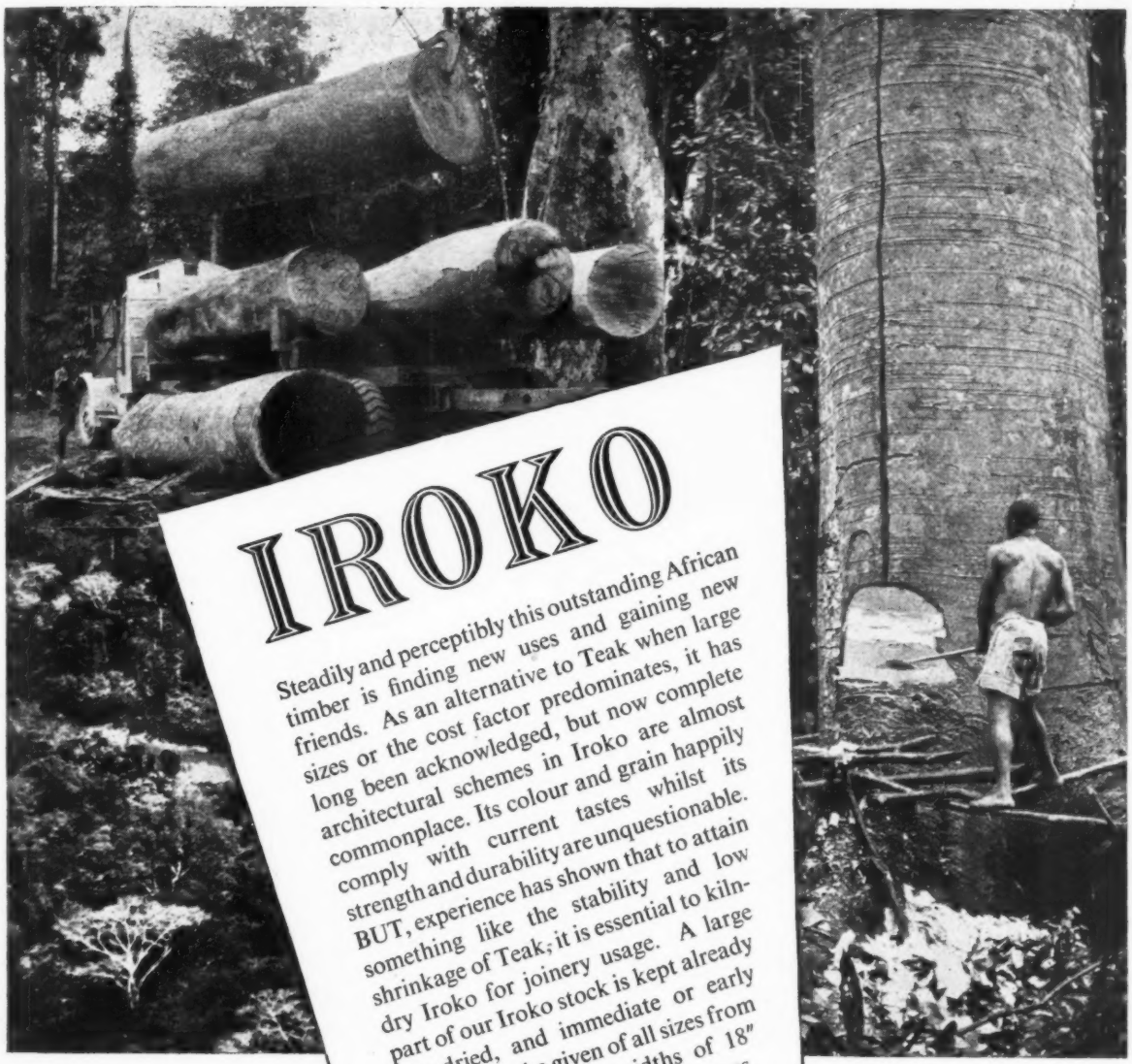
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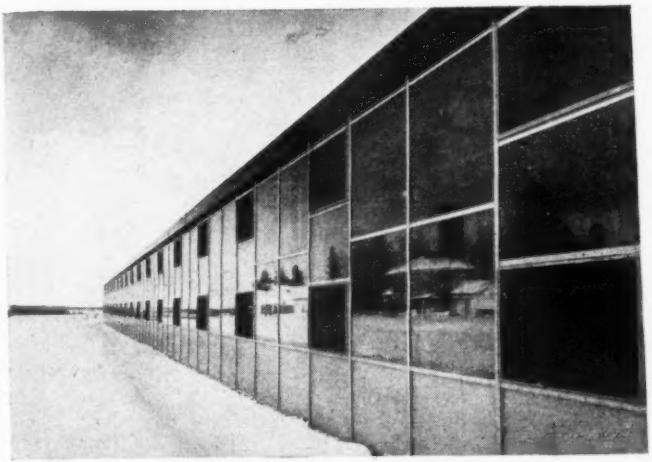
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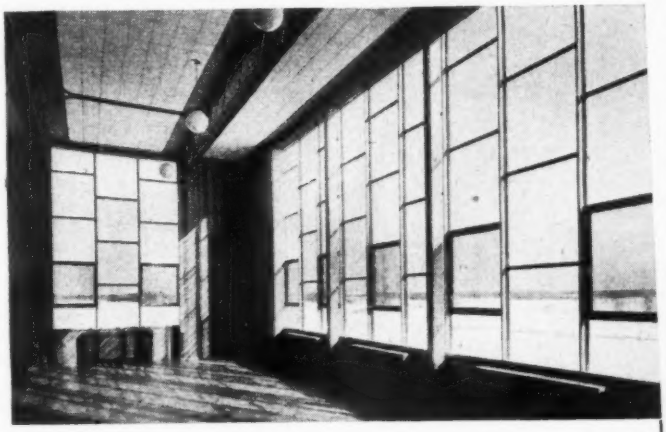
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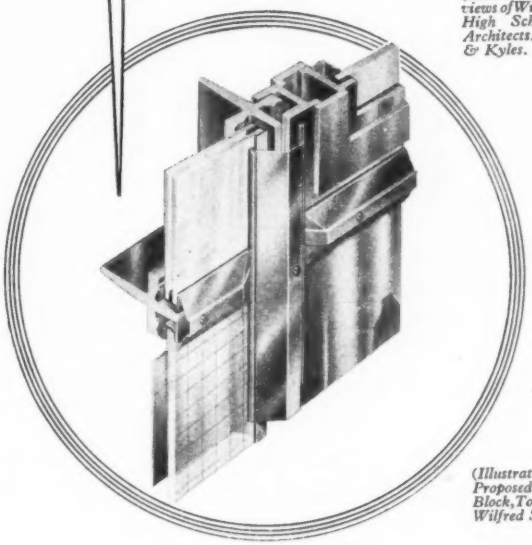




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(Illustrated left). Two views of Wingham District High School, Toronto. Architects: Messrs. Kyles & Kyles.

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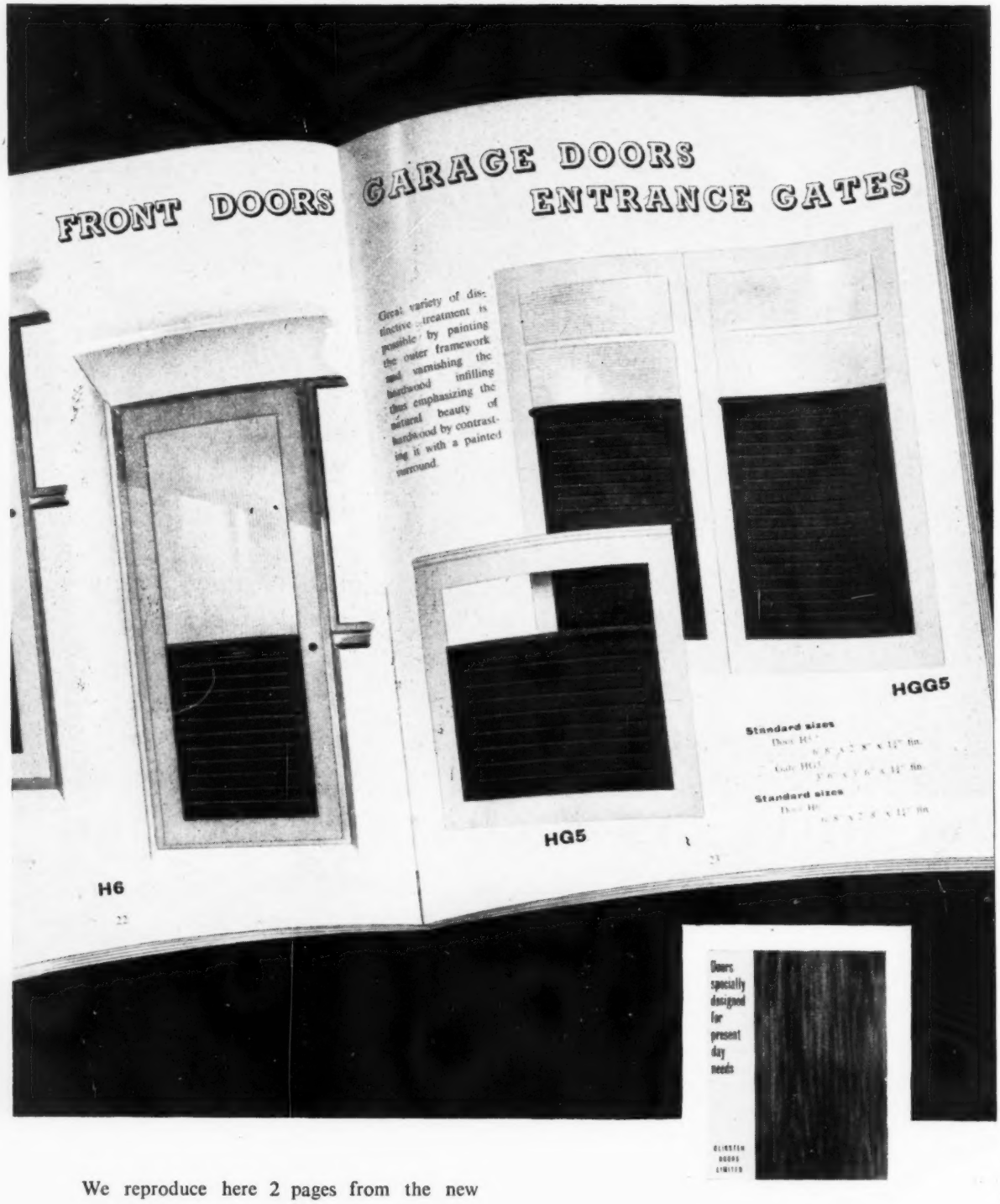


(Illustrated top right). Proposed Apartment Block, Toronto. Architect: Wilfred Shulman.

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IT PAYS TO THINK OF DEXION

–at the planning stage



Service Depot builds storage platform. *Iron Bridge Service Depot Ltd. of Southall, Middlesex, built this overhead storage platform to carry 20 tons of motor-car parts. It effects a big saving in space, and the supports also serve as dividers for storage bins. Storage structures of Dexion can make full use of any existing space; and they have the great advantage of ensuring easy adaptability to changing needs.*

A FACTORY LAYOUT must be flexible, capable of being adapted at short notice to changing circumstances. This applies particularly to storage requirements and works equipment.

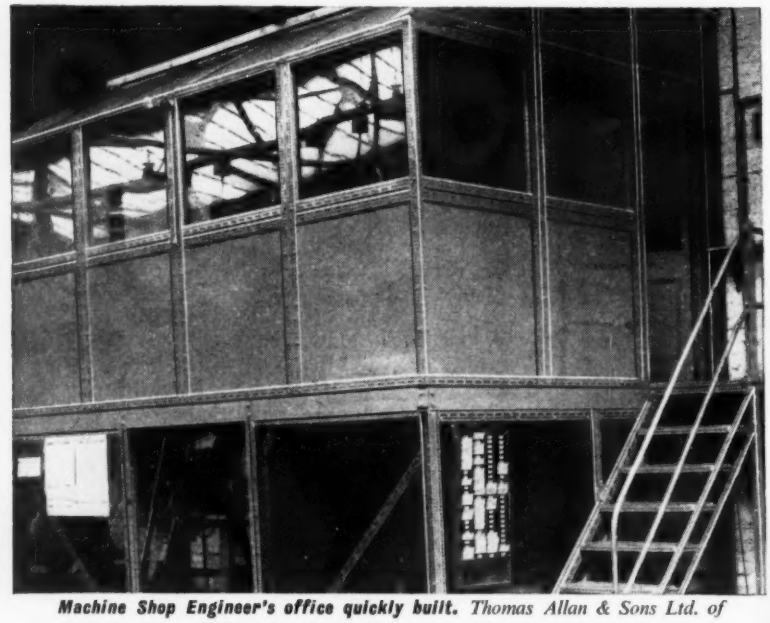
There is no more versatile material for building stores and equipment, exactly to your own designs, than Dexion Slotted Angle. Such Dexion equipment is quick and cheap to install. And any Dexion structure can be readily adapted and altered to meet changing needs. There is no waste, no scrap: Dexion is fully recoverable, and can be used again and again.

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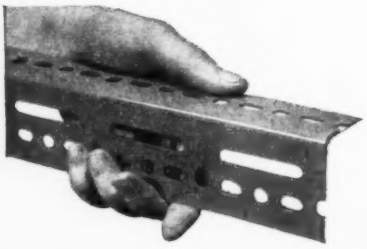
A technical design and estimating service is available free; and for large installations, construction teams will carry out the work if required.

GET THE FACTS

Dexion 225 is sold in packets of ten 10-ft. lengths, complete with bolts. Steel Dexion (price from 1/3½ to 1/5 per foot) is rust-protected, stove-enamelled. Where a light but strong, non-magnetic, non-corroding material is required, use Alloy Dexion (full technical details and prices on request). Send today for sample piece of Dexion and illustrated booklet AN. 143 showing many uses in industry. Dexion Ltd., 65 Maygrove Road, London N.W.6. (Telephone MAIda Vale 6031-9.)



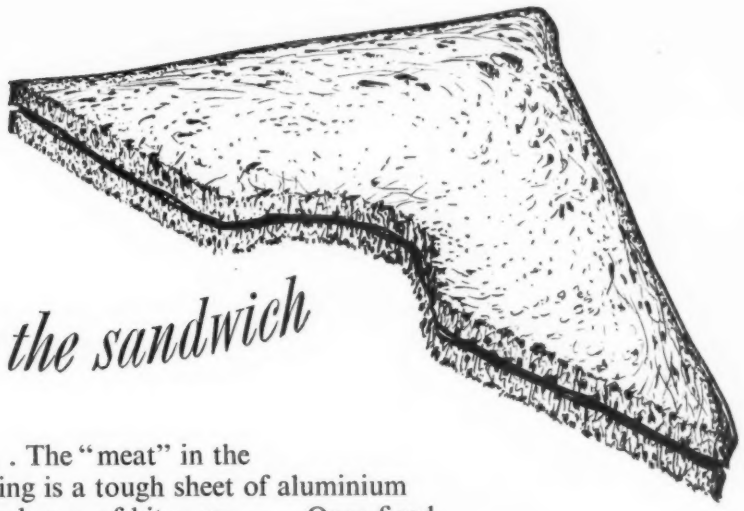
Machine Shop Engineer's office quickly built. *Thomas Allan & Sons Ltd. of Thornaby designed this office with tool store underneath to be built with conventional materials. They used Dexion instead when they found it was quicker and cost less. In jobs of this sort, Dexion invariably supersedes old-fashioned materials and methods.*



DEXION

REGD.

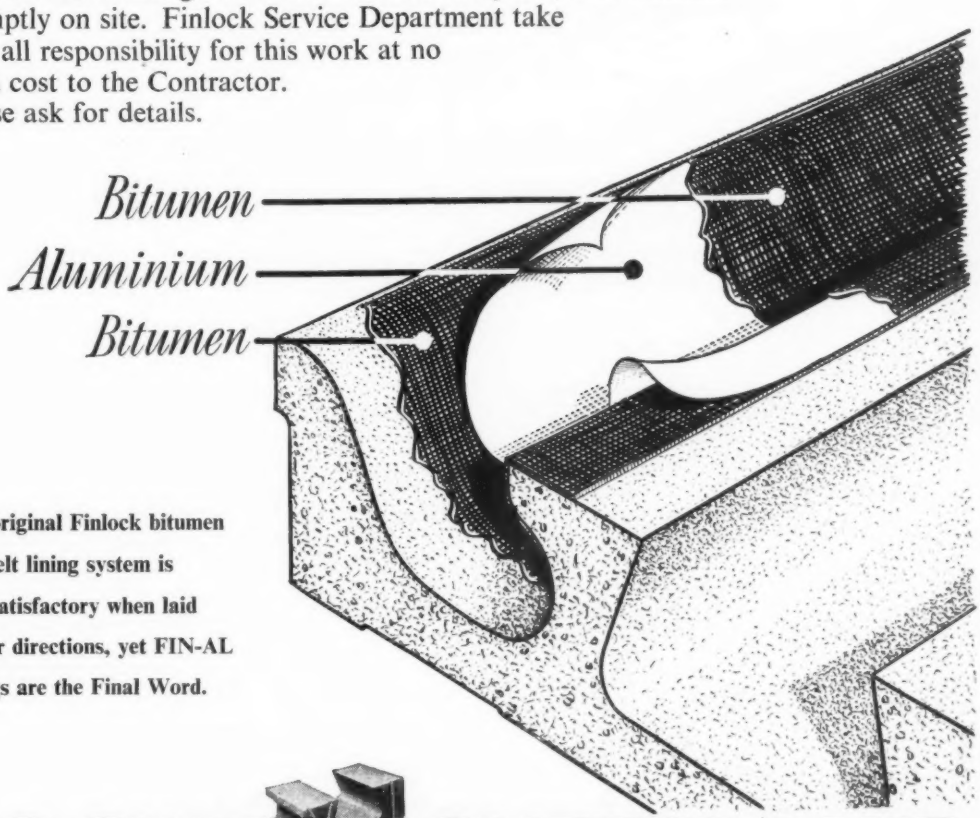
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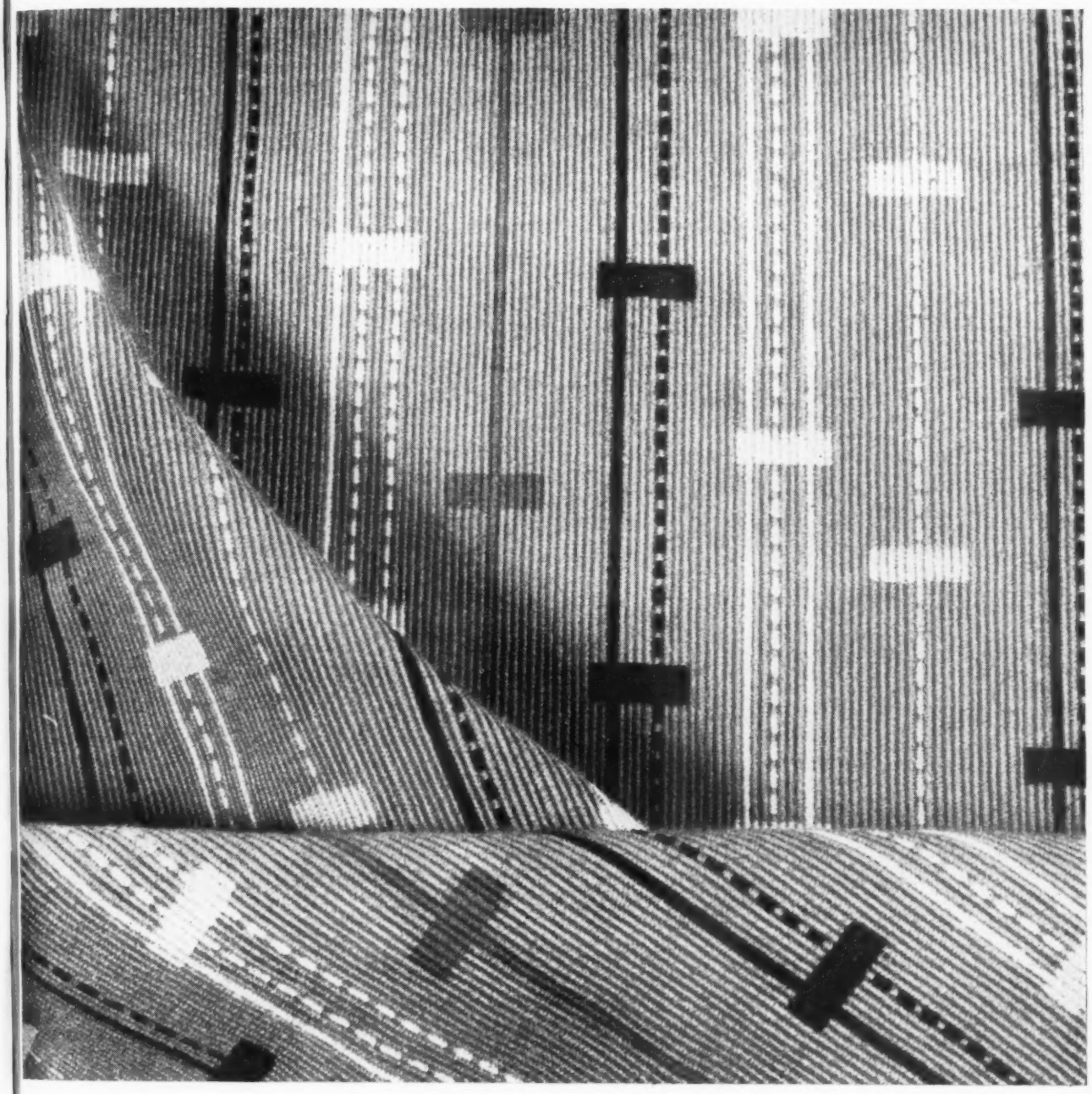


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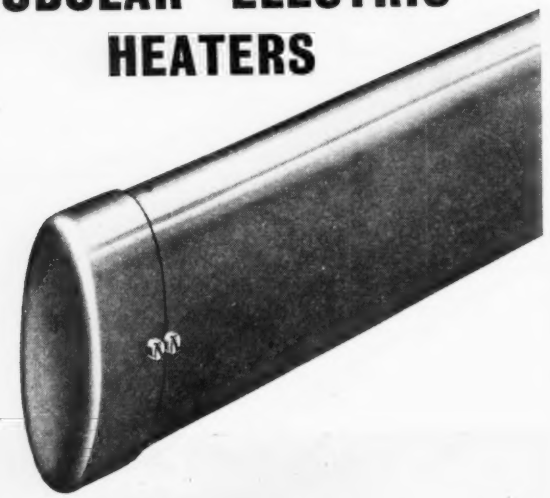
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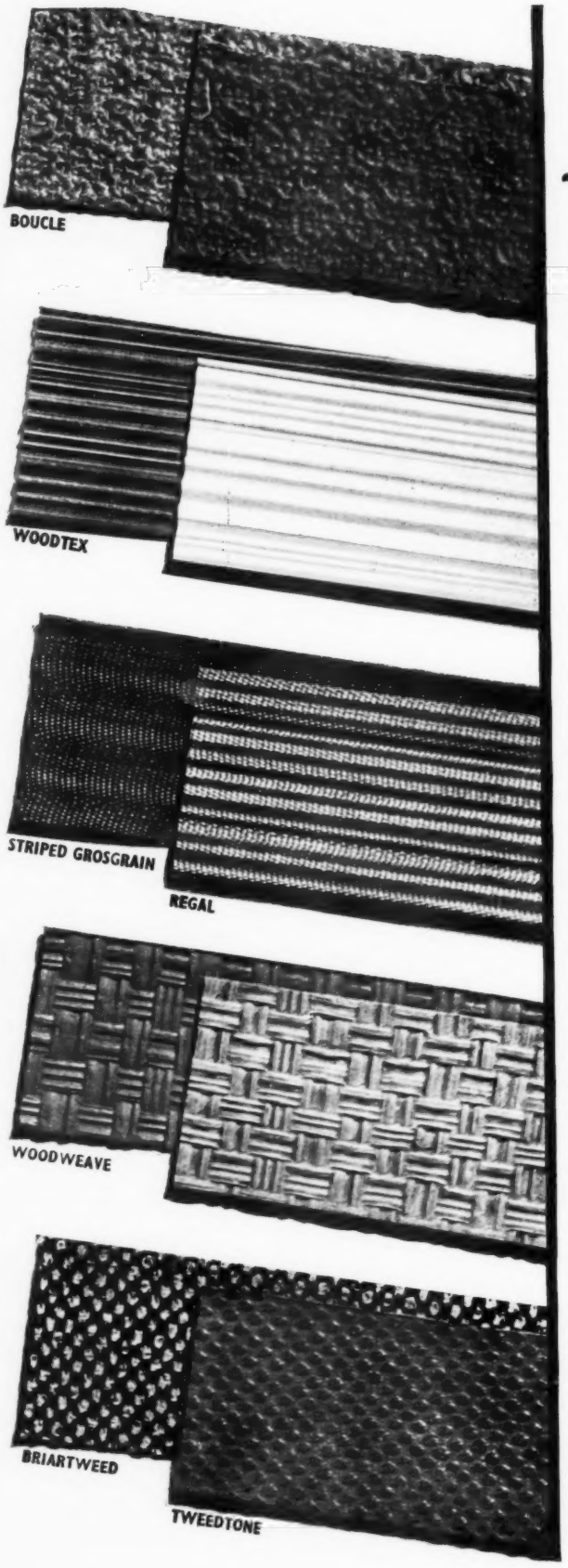
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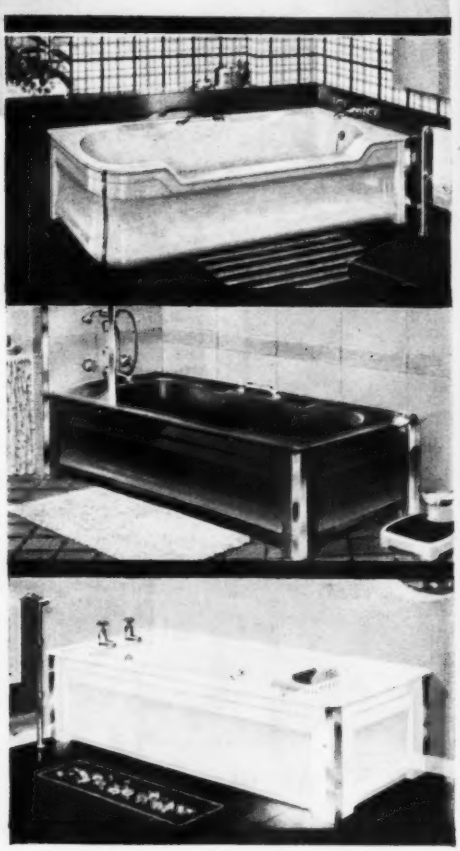
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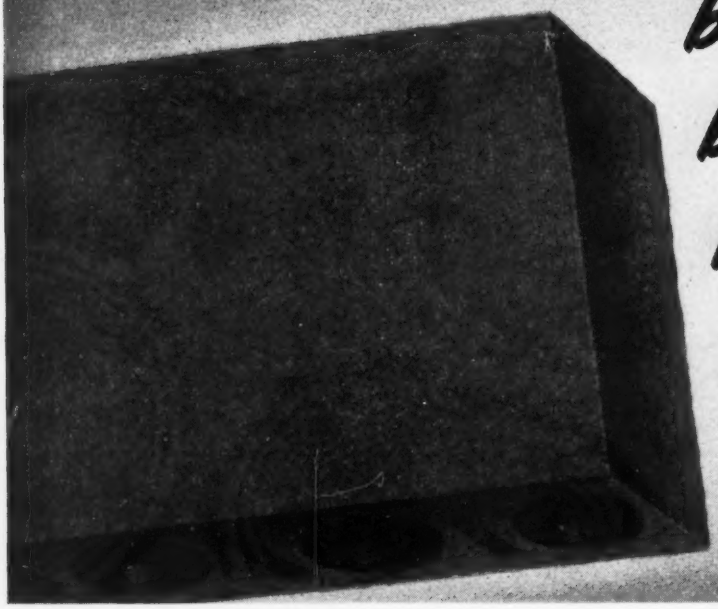
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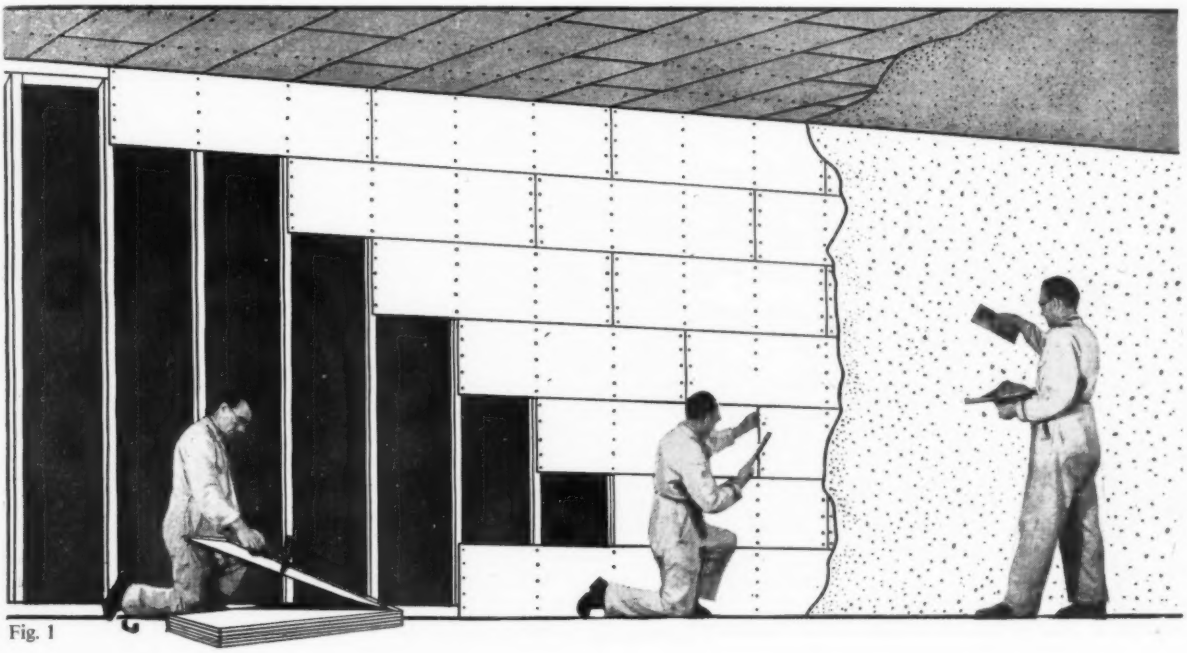


Fig. 1

Diagrammatic representation of the correct application of GYPROC Lath

1. Longitudinal, paper-covered, rounded edges of lath fixed across studs or joists.
2. Five nails per width of lath on every stud or joist.
3. End joints in each course staggered and fixed centrally over a support.
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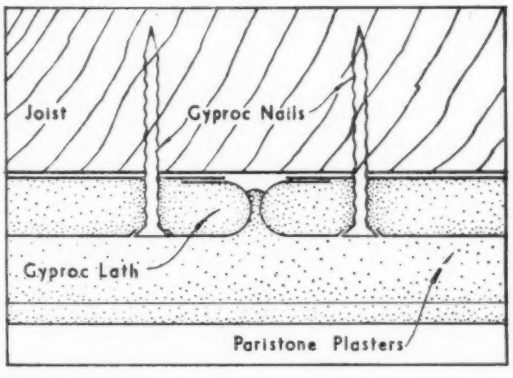


Fig. 2

A high degree of fire resistance is afforded by *plain* **GYPROC Lath** plastered with either Paristone or Gypstone, but for special purposes, an even greater degree of fire protection can be obtained by using **GYPROC Perforated Lath,** plastered.

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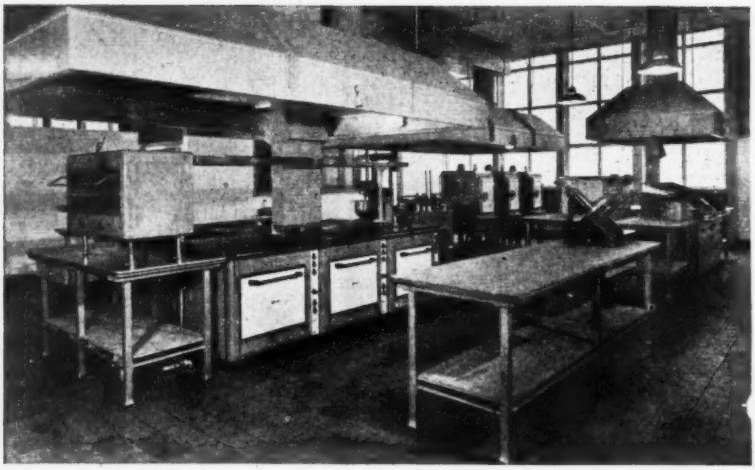
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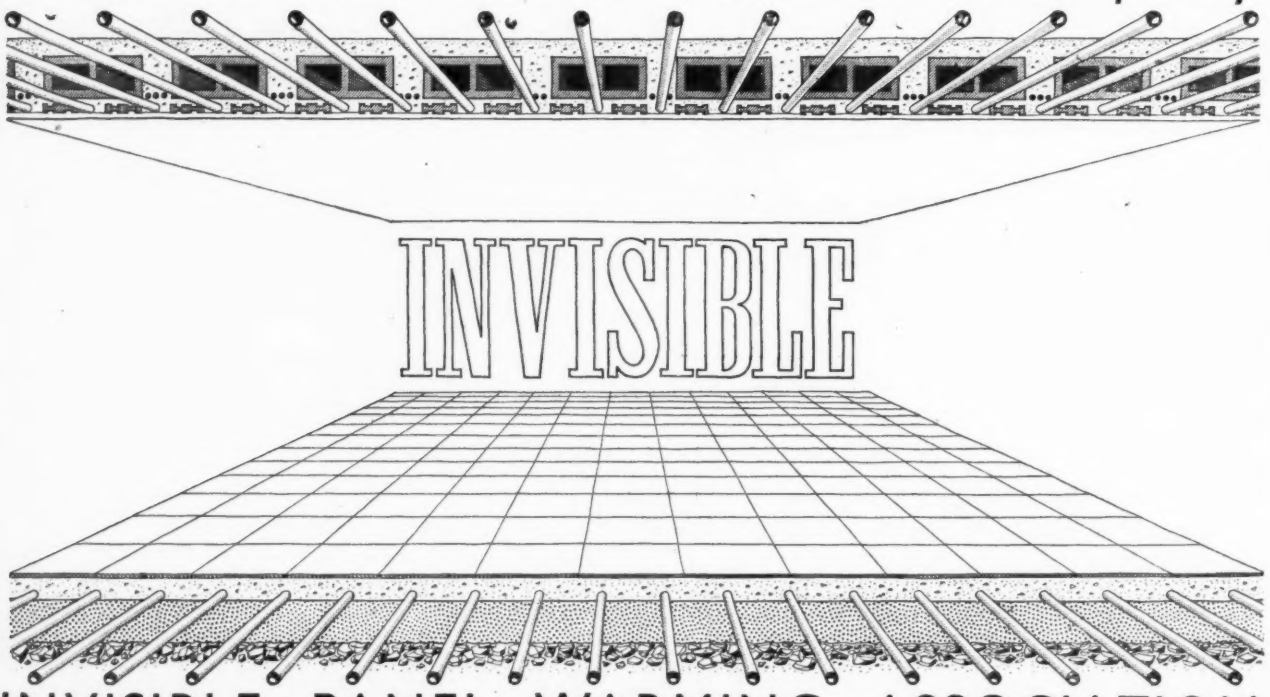
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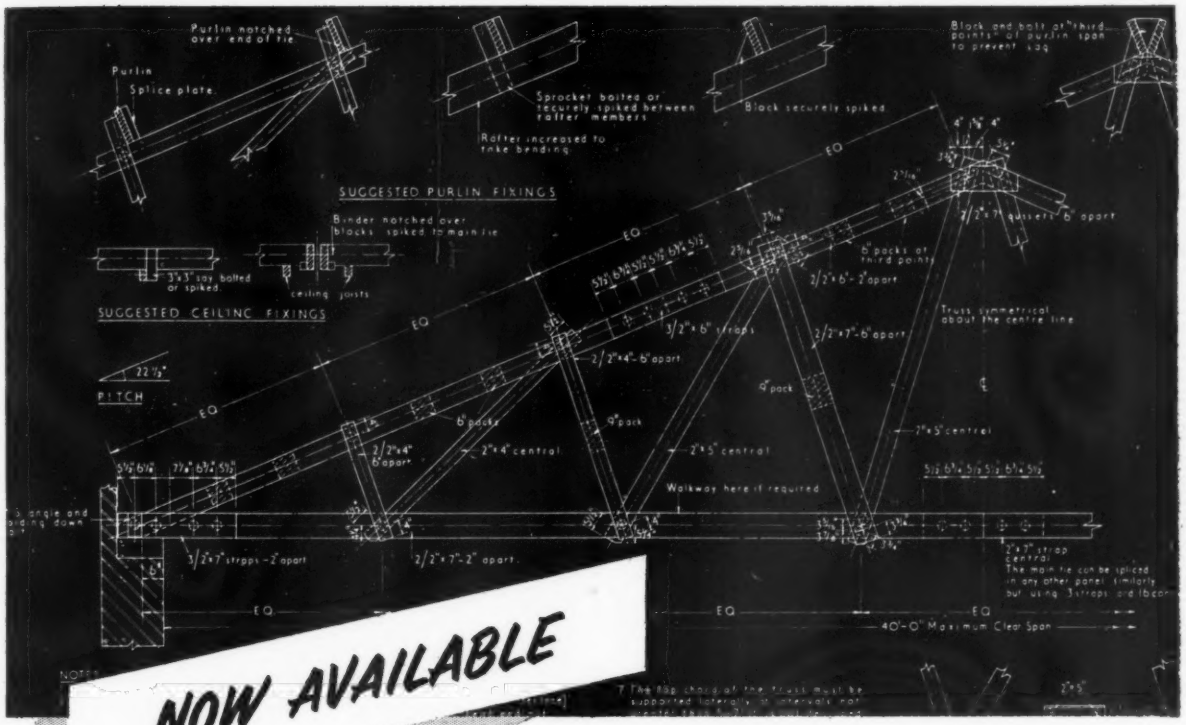
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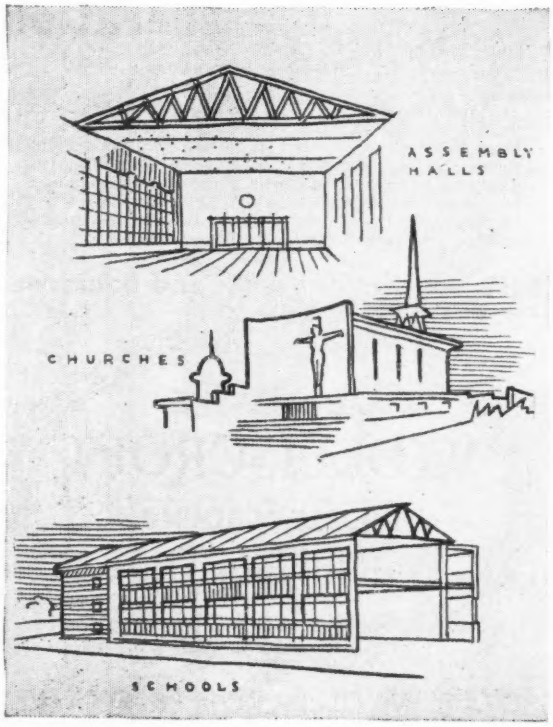
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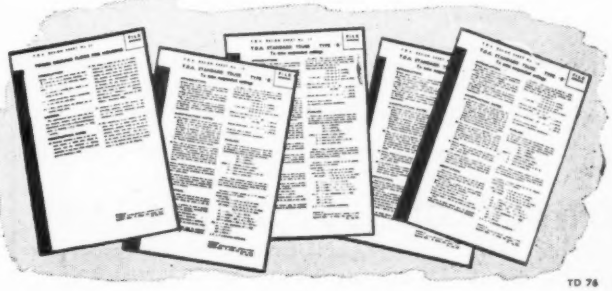
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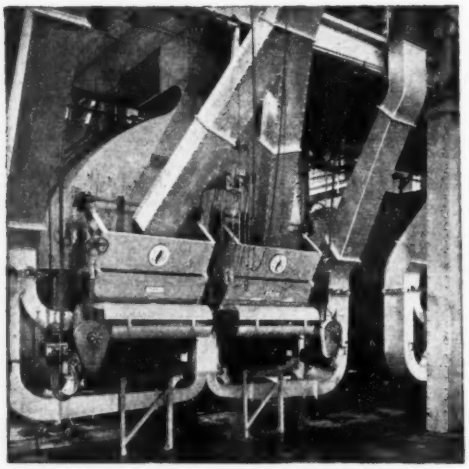


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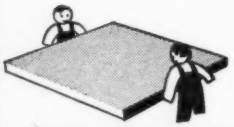
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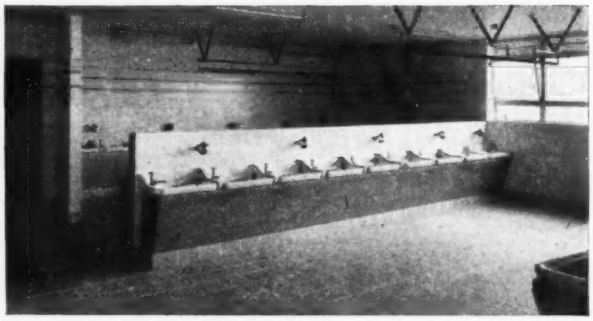


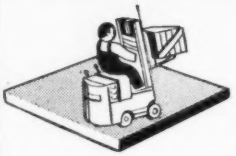
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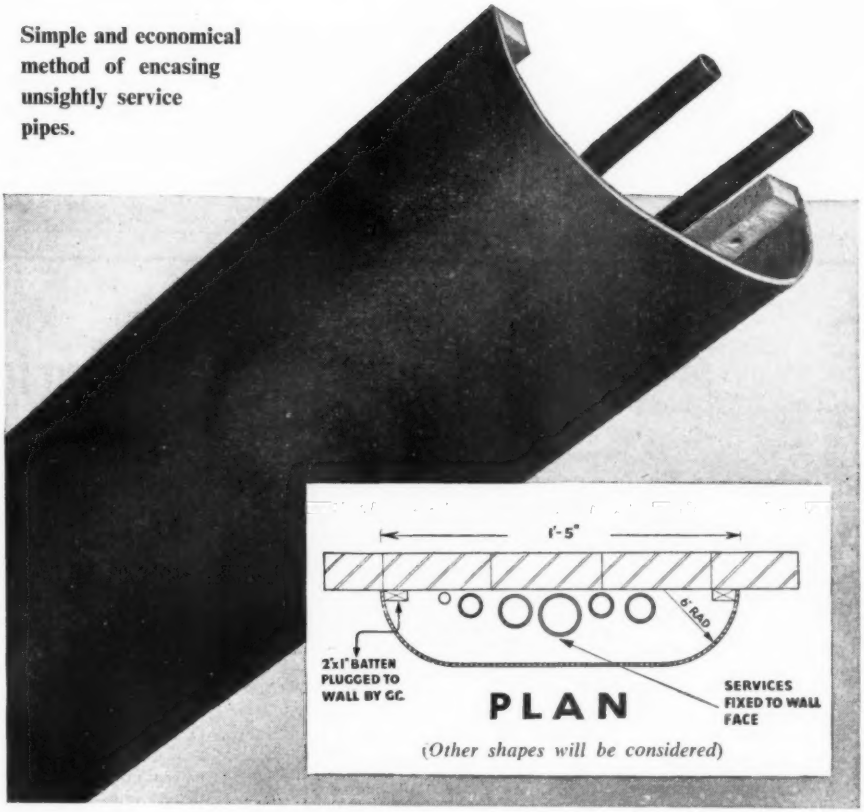
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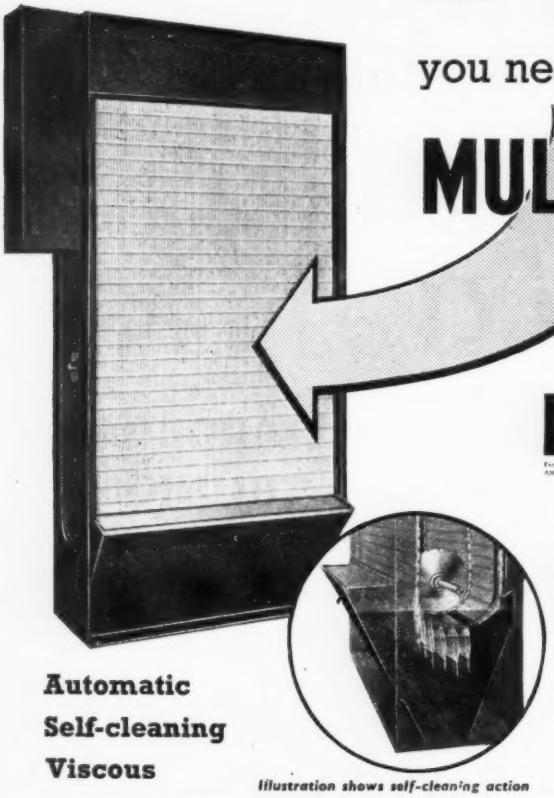
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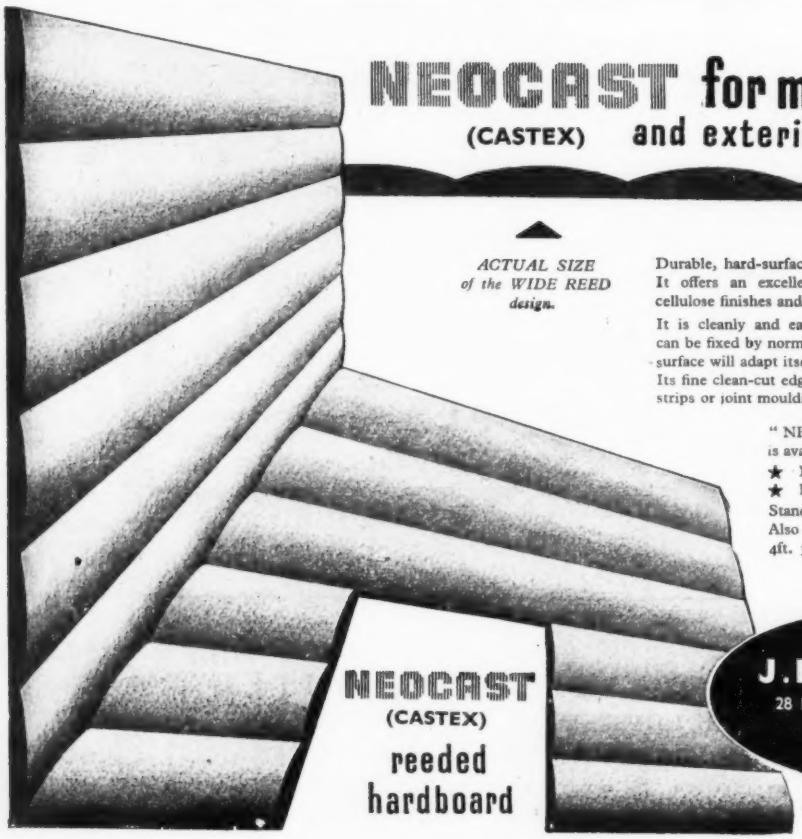
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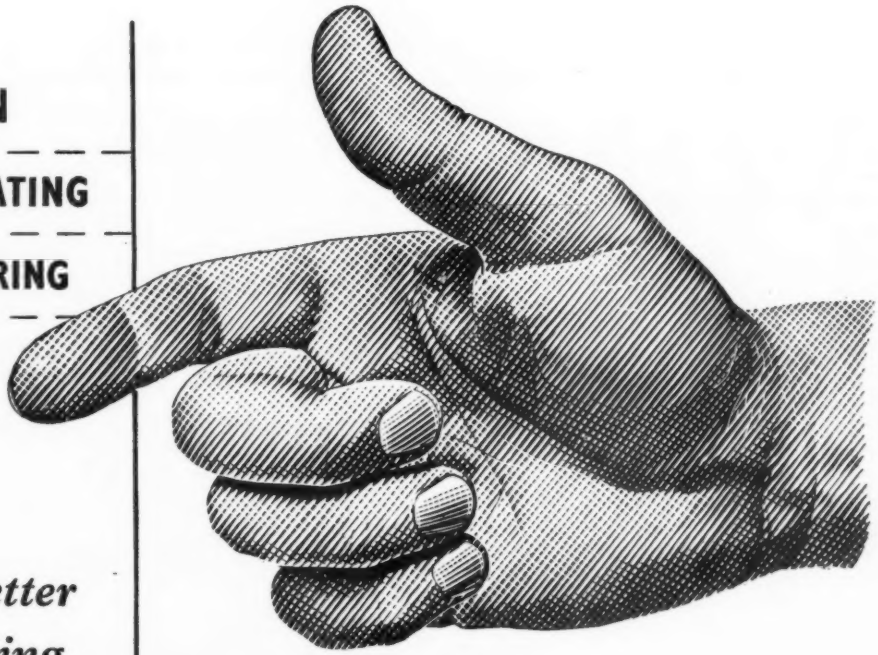
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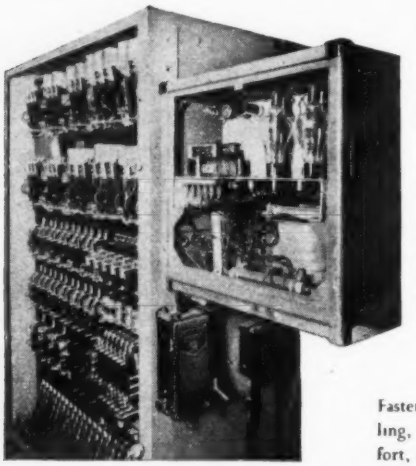
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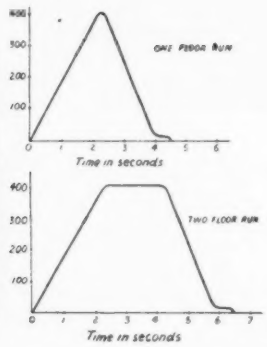
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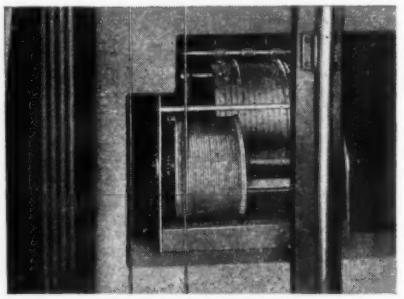


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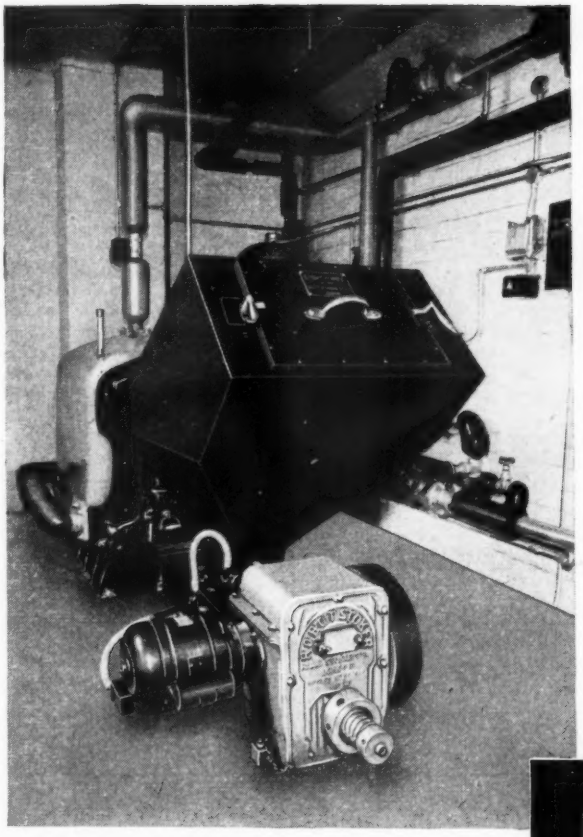


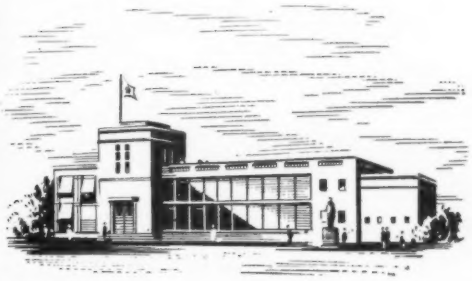


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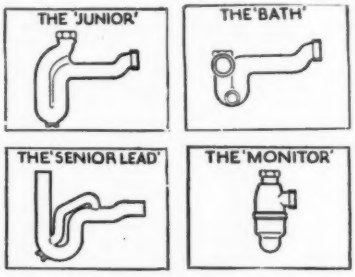
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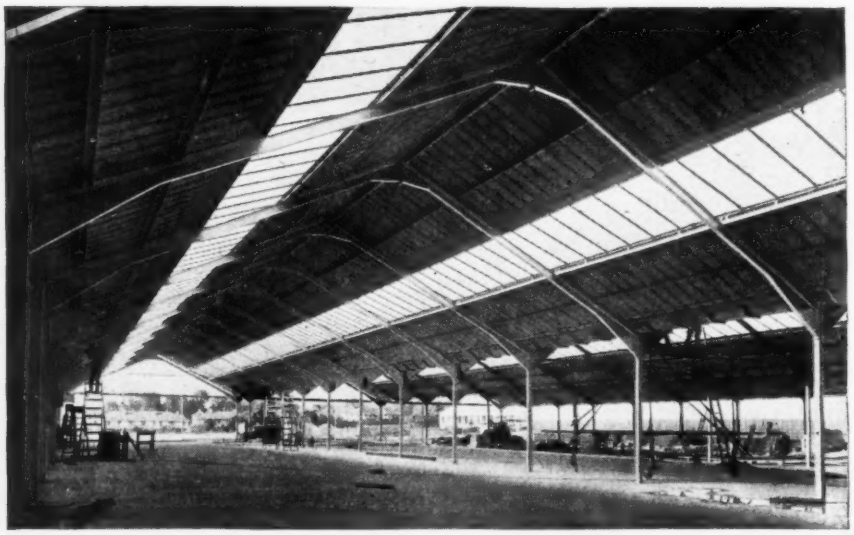
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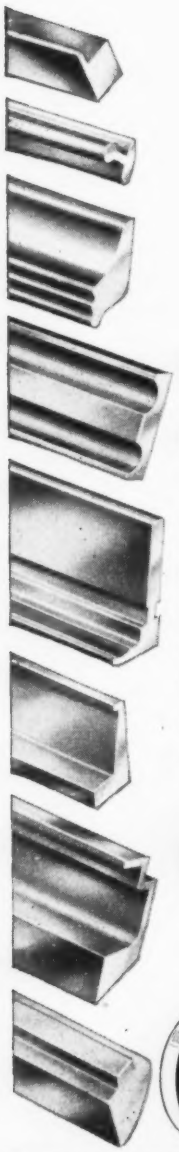
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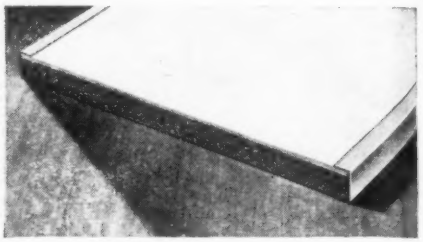
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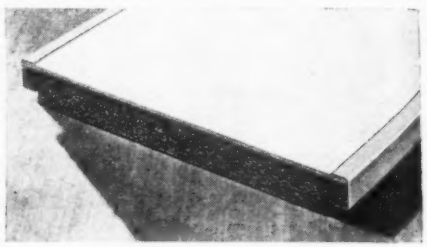
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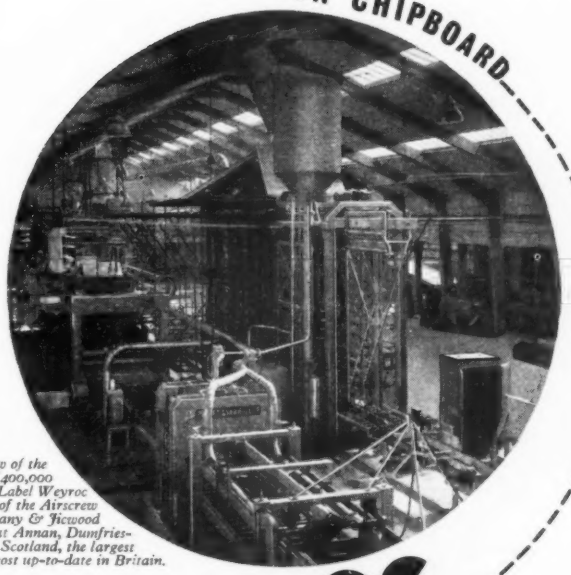
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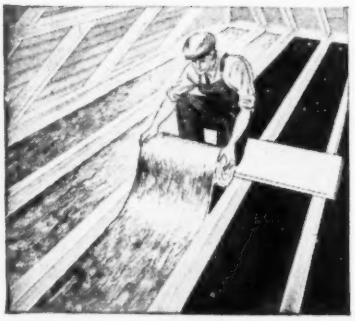
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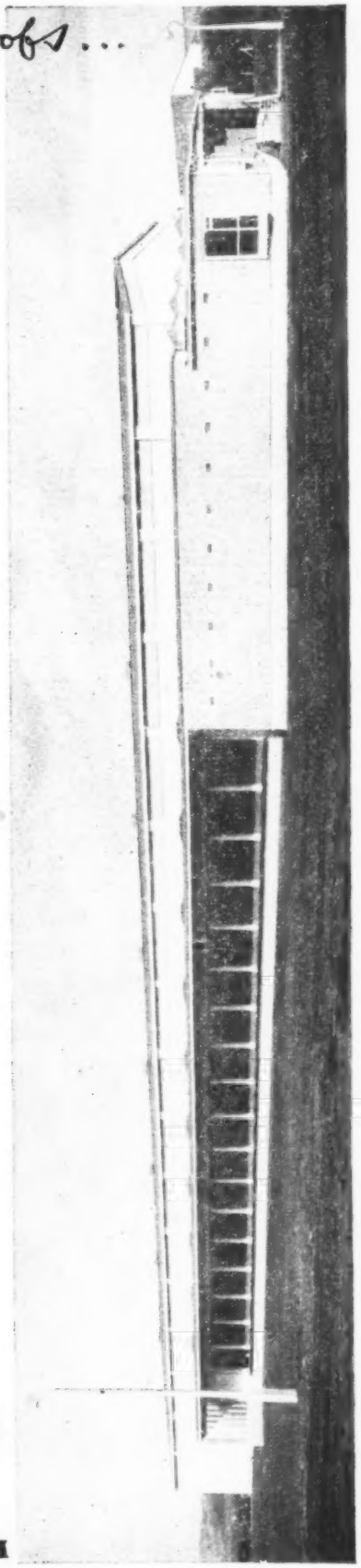
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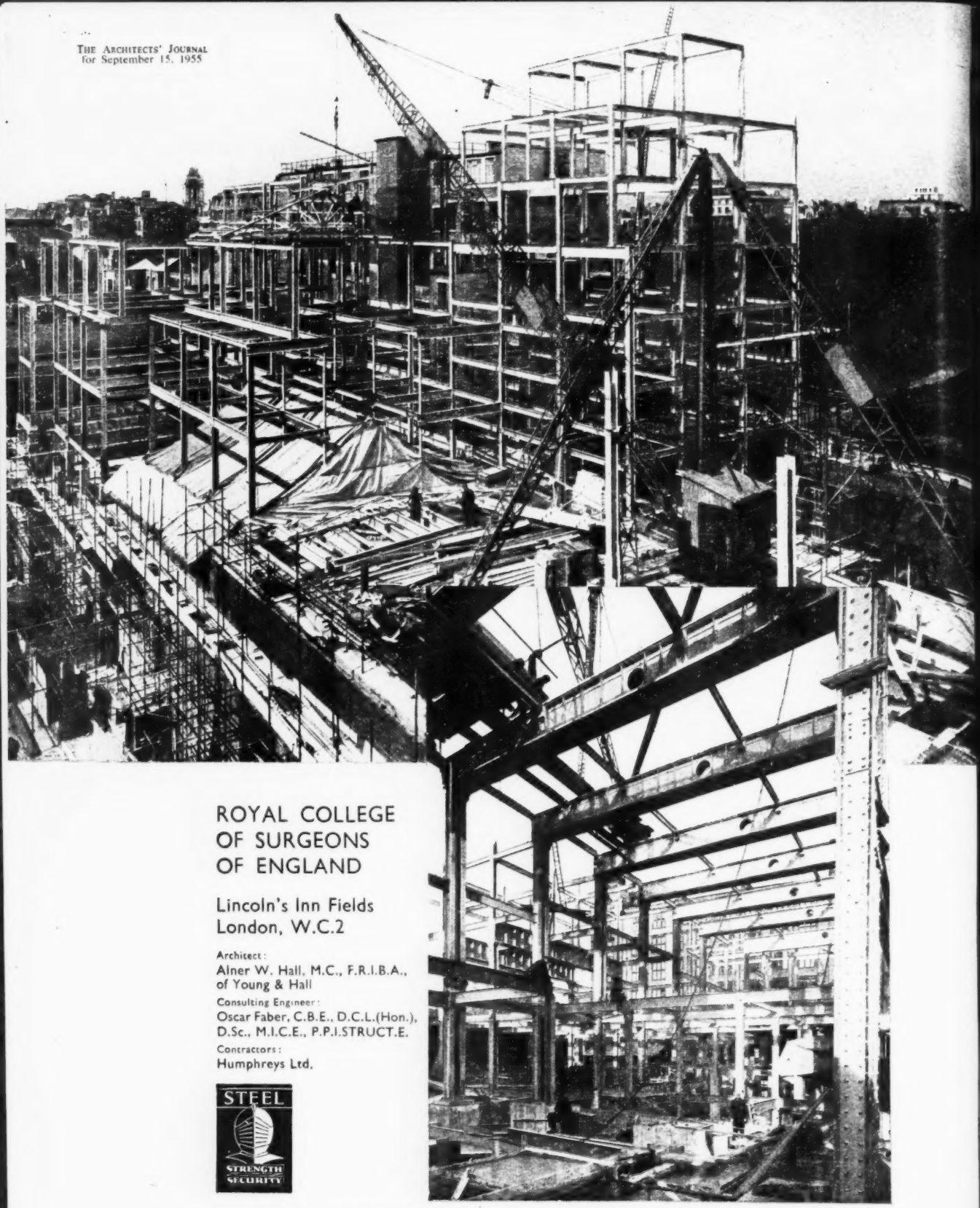
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No. 3159 September 15, 1955 VOL. 122

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ARE YOU A WANTED MAN?

If you are a man with the right ideas in the wrong job and have not found something to your taste in this week's "vacancies" column, do not miss page cxii. There you will see an unusually enormous (and well-designed) advertisement for architects in the City Architect's Department at Coventry. Presumably this advertisement is intended to attract the attention even of those of you who are too happy in your work to look through the list of vacancies, but would be even happier to work in a Department which is responsible for the most exciting city reconstruction in the country. ASTRAGAL, who had heard that the deputy architect, D. E. Percival, is shortly taking over the post of City Architect in Norwich, was surprised to find no advertisement for a deputy for Arthur Ling. Does Mr. Ling intend to do without one? No doubt we shall soon hear of his plans. In the meantime I shall withhold comment and simply advise you enlightened youngsters to study Coventry's advertisement. And if you want a reminder of the success of Coventry's rebuilding, under Mr. Ling's predecessor, D. E. E. Gibson, turn to page 344.

EXCLUDING THE ARBITRARY

Listening to Leslie Martin's BBC talk on the Third, in connection with the Mondriaan exhibition at Whitechapel which closed this week, ASTRAGAL found himself forced to think very hard, and in opposition to the speaker. Dr. Martin proposed that "Mondriaan's Method" should be the method of every architect, the essence of that method being the exclusion of every arbitrary element. Hear! Hear! This is fine fighting Llewellyn-Davies talk; but is it, in fact, what Mondriaan did?

*

A great deal of Dr. Martin's talk was devoted to an exposition of how Mondriaan gradually purged his art of all extraneous references to the world of nature, until he was left with a pure composition of rectangles on a rectangular canvas. The result has been described as non-objective art, and ASTRAGAL would like, seditiously, to suggest that it is just that; art without objectivity, and a shocking exemplar to architects who, if they followed "Mondriaan's Method" would purge their art of all extraneous references to such things as the site, the climate, functional needs, circulation, services and so forth, in order to be left with a pure composition of cubic volumes on a rectangular plan.

*

The exclusion of the arbitrary is a model discipline for architects, but "Mondriaan's Method" was nothing but arbitrary, and having purged the canvas of all objective references of the outside world he composed those elegant eye-soothing grids according to pure personal fancy, as several eye-witnesses attest—and what is that, if not arbitrary?

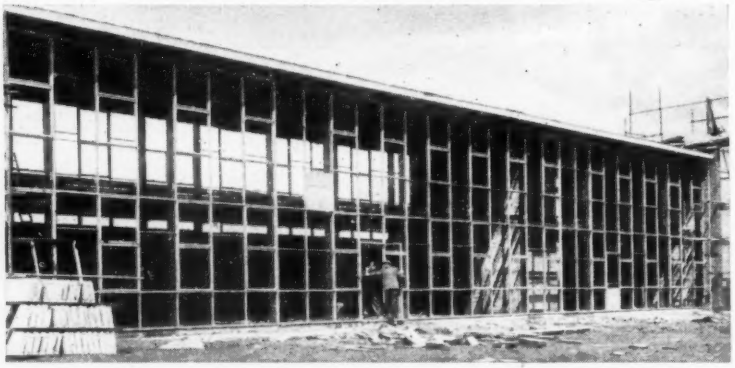
FOR RAILWAY FANCIERS

Railway-fanciers, headed by ASTRAGAL, will welcome the excellent new number of *Design*, which is devoted almost entirely to problems of design on and around the iron road. Gratifyingly free from sentimentality about steam, it presents an anthology of new diesels and electrics, considered as complete trains, rather than piece by piece, and has a lot to say about the design of their interiors. ASTRAGAL particularly liked a rap over the knuckles for British Railways for using pedestal basins in toilets. "Inappropriate," says *Design*, "and reflects suburban snobbery."

*

Impressed though he is by this issue, ASTRAGAL found himself disagreeing with some of the things in it. A page of examples of railway-station subtopianism was headed "Disorder": but is disorder, as such, the real menace? One of the dreariest views on the page was of the very-orderly waiting room at Liverpool Street, whereas much of the *poésie des départs* of our great main-line termini is due to the improbability and incongruity of their

WINDOGRID
Curtain Walling



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L. C. Lomas, F.R.I.B.A.
County Architect for Worcestershire

ANOTHER SCHOOL WHERE THE ENTIRE FAÇADE OVER 100 FT. LONG IS CLOTHED IN HOPE'S WINDOGRID. INSULATING PANELS WILL MASK THE FLOOR LINE, GIVING A PATTERNED SURFACE TO THE WHOLE ELEVATION

Send for List 295

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MEMBER OF THE METAL WINDOW ASSOCIATION



Not New England, but New Norfolk. See ASTRAGAL'S *note on this page.*

interior landscape. The point was nicely brought out by a view of a corner of Paddington, below, whose lighting and wide-screen format make it so certain that a harassed Orson Welles or Kirk Douglas is about to stagger furtively out of the Gentlemen's that average film-going citizens, headed by ASTRAGAL, would be very reluctant to have it tidied up in the name of "Order."

A SPIRE IN NORFOLK

Bawdeswell, a Norfolk village known to my readers only because it has a passing mention from Chaucer in the "Canterbury Tales," got itself into *The Times* recently, and for architectural reasons, of all things. Bawdeswell's church has been a local by-word ever since an errant RAF bomber crashed into it late in the war, and the problem of rebuilding the church has been a bone of contention for some years—for purely stylistic reasons. If you should think this means that Bawdeswell merely repeats the now-customary pattern of architect-wants-modern: diocese-wants-traditional, a glance at the picture above will disabuse you, and



This picture, with its low-key lighting and misty atmosphere of suspense, is not published—as you might suppose—for your admiration at the skill of a film-set designer. It appears, under the ruthless heading of "Disorder," in this month's Design*—an excellent special issue on railways.* ASTRAGAL'S *comment begins on the previous page.*



A Threat To Pedestrians

Coventry has built half its proposed full-scale pedestrian precinct. The success of this scheme (shown above) was referred to this week by Professor R. Gardner-Medwin, in his Third Programme broadcast on *Rotterdam and Coventry*. "In spite of the building activities still going on," he said, "it is surprising how already it is beginning to take on the thronging promenade character of the Rotterdam centre. A well-planned bar, a coffee-house, a popular terrace restaurant, and Coventry citizens will begin to imitate the more sociable city habits of the Continent." There is, however, a danger that this unique example of English city-centre planning will be spoiled. It is now proposed that a minor traffic road shall be driven through the middle of the precinct. "Disastrous" was the word Professor Gardner-Medwin used about this proposal; and disastrous is not too strong a word to use about a suggestion for the ruining of any imaginative touch in our only city centre to be rebuilt with imagination. We hope that Coventry, a city that created conditions under which imagination could be used—(among other things, as Professor Gardner-Medwin pointed out, it made its city architect its city planner)—will think again before allowing a pedestrian proposal to mar its pedestrian precinct. The precinct—in which the low-walled features surmount public lavatories—was designed by W. S. Hattrell and Partners, under the control of the City Architect's Department. Most of the work shown here was done under D. E. E. Gibson, but the remainder is, of course, being done under his successor, as City Architect and Planner, Arthur Ling. (See also ASTRAGAL'S first note on page 341.)

probably startle you as well. Bawdeswell now has the nicest Colonial church to be seen outside New England, and USAF personnel from the big base at Sculthorpe, about a dozen miles away, must feel quite at home.

*

But the Parochial Church Council didn't feel at all at home with it, particularly that spire, which they asserted was not in the "Norfolk Tradition." However, the architect (J. Fletcher Watson), the diocesan advisory committee, the parish council and the rector all stuck to their guns and got their spire. It is very pleasant to be able to record this sort of victory over the kind of dead-head-ism whose only aesthetic standards are those of "Keeping in Keeping," though just how the allegedly traditional, square, flat-topped Norfolk tower would have been in keeping with the Wren-school nave, porch and transept is difficult to see—the PCC would have been muddling its own intentions even if it had got its way.

*

Even if this isn't just how you personally, dear reader, would have designed a parish church in 1955, you will surely applaud the way the normal compromise get-outs have been avoided, and a complete and integrated architectural conception has been executed *as designed.*

ELECTRONIC MOTORING

ASTRAGAL does not much care for the idea of motor-ways on which radio-beams will control steering—a prophecy made last week to the British Association by a representative of the Society of Motor Manufacturers and Traders. Getting into a car with no steering and dialling TAU, for Taunton, may be an *efficient* way of travelling, but one might just as well go by train. Perhaps push-button motoring could be reserved for the charabancs, the lorries and the plain stupid.

*

Thank goodness there will always be secondary roads on which driving (in an archaic car) can be fun. Someone suggested to the British Association that such roads might have to be preserved as carefully as ancient buildings. Just think how nostalgically an Electronic Age Betjeman will write of the charm of the dear old pot-holed roads.

ASTRAGAL

POINTS FROM THIS ISSUE

The New **Coventry** pages 341 and 344

Pre-planning and **Site Organisation** : another article by the Guest Editors page 350

Factory Built on Future **Coal Mine Site** page 355

New **Design Centre** for COID page 366

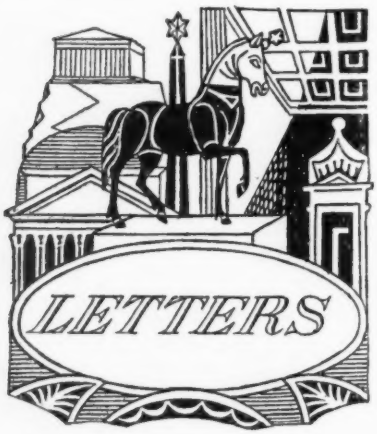
The Editors

THE SELF-EFFACING MINISTRY

SLUM clearance and the future of the blighted districts; overspill and small town development; the review of housing subsidies and the Rent Restriction Acts, the location of industry and the recasting of local government boundaries." These Professor Myles Wright listed in a recent Third Programme talk as "problems that are at once local, regional and national (which) have been left without attention for far too long and can't be left alone much longer." With the last point we are all agreed, and the first part of this contention is substantiated by a study of the MOHLG's report for the period 1950 to 1954, published at the beginning of the month. This report shows that, with regard to slum clearance, only 63,000 houses have been demolished. Or, to put it another way, of the houses built in that period, only one-twentieth were used to house people from slum areas. On small town development the Ministry's report is even more depressing. It lists less than a dozen towns which have agreed to take overspill from large cities. Of these, four reached agreement before the Town Development Act of 1952, and one, Bristol, disqualifies itself for the Government grant by decanting its overspill into sites on the periphery of its own built-up area. As for subsidies and rent restriction, MOHLG raised the first by nearly two-thirds in 1952 and allowed rents to be increased to meet the increased cost of repairs—actions which confirmed that both topics were considered political dynamite. With regard to industry the Ministry has little to say. It notes that local authorities are planning to discharge it from areas where it is a "non-conforming user," and points out how expensive it would be to compel such owners to move their factories (but not, surely, if rebuilding was not permitted?) Obviously the Ministry cannot say a great deal when the subject belongs to the BOT. On Myles Wright's last point, the reform of the local government machine, the Ministry's report falls back on the last possible line of defence for its inertia by saying that the Minister has started discussions with the local authority associations on this question.

This report makes it abundantly clear that planning is becoming more and more a back number in the interests of the Ministry. The report consists of 9 chapters, titled as follows: Introduction, Housing, Local Government, Water and Sewage, Planning, Minerals, New Towns, Local Gov-

ernment finance and Wales. Large portions of the two chapters headed Local Government and Wales, and the whole of Housing, Water and Sewage, New Towns and Minerals, should come, one would have thought, under the general title of planning. With a live Ministry one might expect some report on the co-ordination which has been achieved with other ministries : on land use and development. The views of the War Office and the Ministries of Defence and Civil Aviation on training grounds, depots and airfields, for instance, and the policies of the Ministries of Fuel and Power, Labour, Transport and Agriculture. But the Ministry of Housing and Local Government would seem to have decided that the co-ordination of all relevant ministerial planning policies is not its concern. It worries only about the paper plans of local authorities, and details such as trees, historic buildings, footpath surveys, national parks, caravans and so on. All very important, but secondary to having a national policy on transport, power, slum clearance and central area rehabilitation, and the prevention of urban sprawl.



J. E. Jackson, A.R.I.B.A.

R. Bartle

Arthur Johnston, A.R.I.B.A.

Jeffrey Webb, A.R.I.B.A.

Brian O'Dell, Student R.I.B.A

Aim At Air-Tight Windows

SIR,—We lag terribly in the design of doors and windows in this country. In my own new house I am now faced with a draught-proofing problem and I am experimenting with door and window rebate design.

I consider mass-produced built-in rubber strip attached to the door stops and magnetic fasteners well worth experiment. I have had them on bedroom doors for eighteen months and they are rattle-proof and very cheap to install, but they need working on from the point of view of windbreak, *i.e.*, they tend to overcome the magnets if windows are left open in strong winds.

Windows are a disgrace as at present produced. Built-in draught stripping is a "must" for fuel saving—surely a tough replaceable rubber strip for the sash to close against is not beyond our manufacturers.

Manufacturers *must* aim at an air-tight window; it is shortsighted to say it is too expensive, particularly in view of rising fuel costs.

J. E. JACKSON.

Folkestone.

The COID Defended

SIR,—Re your editorial for August 11, I am taking a sword and throwing a gauntlet in the arena of dispute in defence of that State institution, COID.

State versus the People—Revolution, never. State versus an Individual or Group, for justice only. I doubt if the COID ever thinks of itself as a judicial body sitting in solemn judgment against A or B, but it does act as an advisory body on design values relative to certain products. Quality testing and market research has some relation to their work, but I can see no reason for its mention, except as a hook to tack a few flimsy paragraphs on.

However objective your generation may feel themselves, truth to materials and form to function is not an invention of this age, and is, on analysis, as imponderable as vulgarity/refinement, taut/slack, simple/ornate. They are, nevertheless, the ingredients in part that distinguishes chaotic matter from sublime form. Function having control over form to the degree of function required; matter being a basic ingredient controls both form and function, aesthetically, geographically and financially.

Market research for what? Fashion taste (élite), fashionable trends (super-élite), public taste (vulgar). National appreciation. National appreciation of foreign characteristics.

Everything made in the USA does not necessarily sell there. We presume they know their own markets as well as we can ever hope to do. The COID may have a shrewd idea of American taste, but a judgment of "catch-on" enters the fields of clairvoyance, so why ask the COID to be a witch doctor?

Fortunately in the COID's defence, proof is in the seeing. The Council has co-operated with manufacturers and designers. It has, through its persuasion, worked wonders not in correcting solitary bad taste but improving standards generally by persuasion, as mentioned—not dictation in any shape or form.

They are a young body so far as Councils go, and perhaps have a lot to learn. One can say this of any organization and not lessen their status or authority by the statement. How it goes about its function is its own business, as far as I am concerned. What results is ours.

R. BARTLE.

London.

The Registration Act

SIR,—To architects the long-awaited amendment to the Architects (Registration) Act is more important than any other issue at the present time, as it will give the RIBA, the power to take positive action on such issues as:—

(1) Problems of architects in private practice.

(2) Standard of professional service given by architects to the public.

(3) Representation of architects in salaried employment.

(4) Etc.

ARTHUR JOHNSTON.

Carlisle.

Knock At No. 66?

SIR,—The salaried official architect, when acting as a private practitioner, cannot operate in anything other than his employer's time, unless he is on a night shift or dealing with clients and contractors who prefer to function at week-ends and after dark.

There is one point that the official architect only begins to understand when his output as a private agent begins to exceed that of his contribution as an official. And that is that to trade as a private practitioner under the cover of his legitimate competitor's subsidy as a ratepayer is making the best of both worlds at the expense of the legitimate trader.

I am wondering whether it would be any good knocking them up at 66, Portland Place, for a ruling.

JEFFREY WEBB.

Dudley.

Why Not Live Here ?

SIR,—"Eastbourne's motto . . . broadly translated, means: 'Let us strive for better things,' and those responsible for the town's development never lost sight of it for a moment." Thus runs the opening passage of Eastbourne's guide for visiting holiday-makers, and with whetted appetite one commences to turn the pages of photographs for signs of these great ideals in practice.

Flipping past the pages of formal flower beds and wedding cake architecture, the eyes are halted by those frightfully jolly creatures running on the beach to the caption of "Race you there" and those ever-so-coy kiddies confiding with "Have you heard?" But, suddenly, the reader is struck with the stunning question, "Why not live here?" to the accompaniment of some pictures of suburban reality that could be just about anywhere.

Perhaps we can express the hope that the recent support given by the popular Press to our constant appeals against the spreading suburban sprawl will have given the compilers of this guide something to blush about.

And as we say farewell to this sunny haven of the South Coast, the guide reminds us of a line by Keats, "A thing of beauty is a joy for ever." Quite so.

BRIAN O'DELL.

London.

[Part of the catalogue referred to by Mr. O'Dell is shown on the opposite page.—EDS.]



MOHLG

Bad Tenants

Ways of dealing with the unsatisfactory tenant or housing applicant—people who get behind with the rent, neglect the house or garden, or are a nuisance to their neighbours—are described in a report* published last week of the Housing Management Sub-Committee of the Central Housing Advisory Committee. Following are excerpts from a Press handout on the report:—

"The Committee urge that for the sake of the children very great efforts should be made to preserve the family as a unit, in conditions in which a decent standard of family life can be achieved. Eviction should be regarded as a stage in the treatment of a family; and where a local authority are obliged to evict a family they should do so with a view to rehousing them ultimately.

"To this end they recommend:

"(1) Housing authorities should have some houses of a standard intermediate between the new houses and the poorest dwellings for families whose standards make them unacceptable to other landlords.

"(2) Rehabilitation services, including help in home management, should be used to prevent the break-up of families through eviction, and to foster their re-establishment in the community if evicted.

"Authorities which do not already possess a pool of houses, intermediate in standard between new and up-to-date houses and those unfit for habitation, might consider acquiring older houses which can often be bought cheaply. These have the advantage that they not only can be let at low rents, but do not require of the new tenant a standard of living so much in advance of his existing standard as to make him despair of attaining it."

HEAT PUMPS

Excessive Purchase Tax

"The widespread use of domestic heat pumps is being seriously retarded by purchase tax levied at the rate of 50 per cent."

That is what the managing director of Brentford Electric Ltd. said last week in a letter to the *Financial Times*, which a few days earlier had published an article on this means of providing home electricity at one-third of the normal cost.

The managing director, J. Gray, went on to say that his firm had "made representations to the Board of Trade for alleviation of this burden, pointing out the coal saving and atmosphere cleanliness factors of a heat pump, and emphasizing that purchase tax was applied on electric water heaters to discourage heavy electrical loadings of the order of two to three kilowatts. The heat pump only takes one-third of a kilowatt and surely makes a clear case for the removal of purchase tax on the grounds of national economy."

In his letter to the *Financial Times* Mr. Gray said: "We were greatly disappointed when the Board of Trade refused our appeal on the basis that present legislation imposed purchase tax on all water heaters unless solid fuel operated! Not only does this attitude on the part of the Government discourage clear savings in our home economy but automatically we are prevented from embarking on full production and thereby developing an export market."

* *Unsatisfactory Tenants.* Sixth Report of the Housing Management Sub-Committee of the Central Housing Advisory Committee. HMSO, 1s. 9d.

COMPETITION

Architectural Photography

The closing date for submission of entries to an *Architectural Design* competition for photographs of modern architecture is October 20. Architects and architectural students only may submit entries. The first prize is £25, the second £10, the third £5. The winning photographs will be exhibited at the Building Exhibition. The judges are Margaret Harker, F.I.B.P., Percy Harris, F.I.B.P., and Frank Yerbury, a member of the Editorial Board of the JOURNAL

Entries should be addressed to The Editor, *Architectural Design*, 26, Bloomsbury Way, W.C.1.



This is the COID's Design Centre Symbol, designed by Hans Schleger. For details of the Centre, which is to be opened in the spring of next year, turn to page 366.

DIARY

The New Towns as Prototypes. Colin Boyne, Executive Editor of THE ARCHITECTS' JOURNAL. A talk in the BBC Third Programme series, "Town Planning and Architecture, 1945-1965: The Half-Way Point." 7.35 p.m. SEPTEMBER 17

New Heating Ideas: At Home and Abroad. A. C. Hazel. Sponsor: Hurseal Ltd. At Building Centre. 12.30-1 p.m.; 4-4.30 p.m.; 6.30-7 p.m. SEPTEMBER 21

Why not live here? See last letter opposite.



BUILDINGS IN THE NEWS



Hotel at Istanbul

The Hilton Hotel, Istanbul (architects: Skidmore, Owings and Merrill, in association with Sedad H. Eldem) was designed "to use steel rods with exceptional economy." The structure stands on continuous footing beams, with reinforcing rods carefully placed to match tension stresses, but designed without too much reliance on bonds. Beams throughout are oversized, not only because of the steel saving, but also because of the likelihood of earthquakes. The main shaft of the hotel contains bedrooms. There are 300 outside rooms and suites, all with open balconies and terraces overlooking the Bosphorous or landscaped gardens.

Housing at Shrewsbury

This housing, in Shrewsbury, for nurses, ambulance drivers, policement and firemen, was designed in the architect's department of Salop County Council (County architect: C. H. Simmons; chief assistant architect: R. Booth; assistant architect: G. Chamberlain). In the scheme shown top right, "The Elms," each terrace house costs £1,991 6s. 6d; each house in a pair cost £1,904 3s. 7d. and site works and garages cost £4,040. In the scheme shown below and below right, "Heathgates," equivalent costs were £1,993 16s. 8d.; £2,208 17s. 4d., and £5,560 9s. 1d.







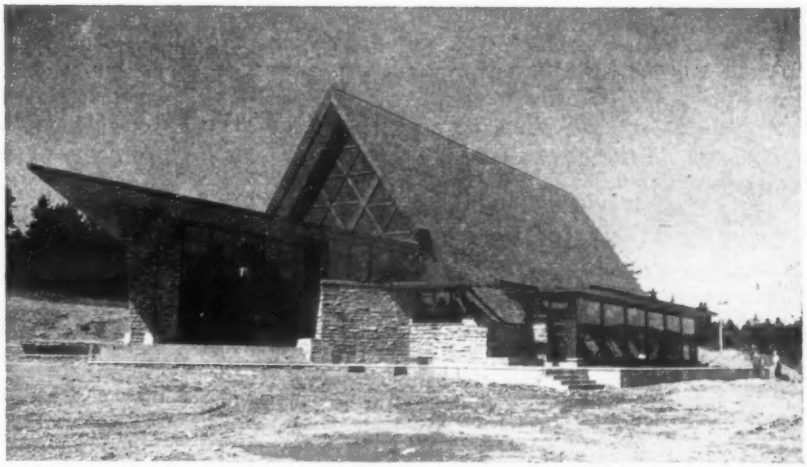
Flats in Chelsea

This block of 12 *higher income group flats, in Cheyne Walk, was designed (as part of the Cremorne Estate) for the Metropolitan Borough of Chelsea by Edward Armstrong and Frederick MacManus (associate-in-charge: Brian Smith). Construction: load-bearing brick external walls, reinforced-concrete spine beams and columns,* in situ *concrete floors, roof and stairs. Facing bricks, Matlock Grey wirecuts. Windows, wood with pre-cast concrete sills. Railings are black; doors are green (Archrome* 28*); reveals on balconies, grey-green; other paintwork, white. Preliminaries, etc., £3,662. Block, £29,275. Site clearance, roads, garages and external works, £6,160.*



Museum in Canada

The building, right, is the recently-completed Bell Memorial Museum, at Baddeck, Canada, designed by O. H. Leicester, who was until recently chief architect to the Department of Northern Affairs and National Resources, in Canada.



Offices in Holborn

This office block (below), for Marcus Securities Ltd., was designed by T. P. Bennett and Son. The seven-storey part of the structure, has a main facing of 3*-in. Portland stone, with Portland stone vertical fins between windows. Window openings, of special metal sections, have* $\frac{7}{16}$*-in. ply-glass apron panels at first floor level. Free-standing columns on the ground floor are faced with glass mosaic. Entrance doors are of silver bronze, with* $\frac{1}{4}$*-in. polished plate glazing. The facing and windows on the* 10*-storey block, overlooking Theobalds Road, are similar. Aprons to the six central bays are of* $\frac{7}{16}$*-in. ply-glass panels. Structure: reinforced concrete throughout, with lateral beams and columns to the central spine only.*





This week, in their tenth article, the Guest Editors (Costs) complete their account, begun on September 1, of how the above-average builder conducts his business. They describe a practical system by which those over-worked words "pre-planning and site organization" can be put into effect.

THE COST OF BUILDING:

THE BUILDER'S CONTROL OF COST

CONTRACT PLANNING AND BUILDING OPERATIONS

In our last article (on September 1) we took readers into the office of a medium-sized builder—"well above the average in quality of workmanship and efficiency of management." We described the way he and his staff would prepare an estimate for a job worth about £50,000. Our intention was partly to show an example of first-class practice and partly to show in some detail the tasks involved—whatever the method of dealing with them. This week we continue the story with an account of contract-planning and building operations. As before, each section is followed by our own comments.

CONTRACT PLANNING

Tender result

The builder has been notified of his success in the tendering and of the amounts of the other tenders. The period of waiting for results—particularly tense for the estimator—is over, and there is a certain elation in the office, the more so because the other tender figures are close, showing how keen was the competition. The next day builder and architect meet to discuss preparation for the beginning of work and the arrangement of a later meeting with the client. The builder explains his position and it is agreed that four weeks will be allowed for contract planning.

In the builder's office

The contract staff now begin to prepare the contract for starting work on the site. They were probably called in by the estimating staff to advise, say, on site methods during the pricing, so they already have some knowledge of the job. The first thing is to assemble information.

(*a*) From the architect: the specification, his own drawings and those of specialists.

(*b*) From the estimator: the list of p.c. items for sub-contractors and suppliers, the priced bill and notes of all the assumptions made during the pricing such as site methods, use of plant, staffing of the job, budgets for tools and materials, the output rates (e.g., bricks or yards cube of concrete per hour) and the probable duration of the contract where it is not stated.

(*c*) From the buying department: the schedule of materials compiled during tendering and the list of the builder's own sub-contractors and suppliers.

The contract staff next visit the site to make a more detailed inspection than the estimator was able to do. They assess what the ground is like, what site works have to be done, how storage space may be arranged, and they investigate the current labour position, which may have changed since the tender date. Meanwhile there will be drawings still to come, delivery periods of the sub-contractors, and the storage space and attendance they require to be ascertained. A list of all outstanding items of information is therefore prepared, with "latest dates" when they must be obtained and "chasing" action is begun. A schedule is also prepared of all those materials and components which need preparation, e.g., precast concrete and joinery. From this the contract manager will have drawings prepared or, where appropriate, he will ask the architect, engineer or sub-contractor for details. The next stage is to call in the general foreman who will manage the contract to help in the preparation of the outline plan.

Outline plan

This entails a number of tasks which may be given, not necessarily in correct sequence, as follows:

(*a*) Prepare a schedule of basic quantities (*i.e.*, with no allowance for waste) on data sheets (see Fig. 1). These data sheets are used both by the contract staff in working out methods and, later on, for ordering materials in running the job. Accordingly the totals are broken down in terms of the main phases of work, *e.g.*, quantities for work below ground, from damp course to the first floor, etc., depending on the type of building. It is worth noting that such a breakdown may roughly correspond to the breakdown into "elements" in cost analysis.

(*b*) Decide outputs. The rates assumed per man hour are then applied to these basic quantities to arrive at the number of man-hours and machine-hours wanted. These output rates—or "standards" as builders sometimes call them—will be considered by the contract staff, the foreman and the plant manager together in the light of experience on other jobs, the kind of labour available and the demand on the company's plant resources generally. They are, of

course, compared with those assumed for the tender. At this stage then, the "work content" of the various operations is defined, in order to assess how best it may be dealt with. There are two leading considerations in this assessment: the first is that of the "key" operation. In most contracts there is one trade or operation that is more significant than any other for the economy of the whole job. The method of tackling this is the main problem to be solved and will, to a large extent, dominate site operations as a whole, other parts of the work being geared to it. It can be likened to that major planning decision which architects find in designing most buildings, a decision which determines the nature of most of the subsidiary planning problems.

The second consideration is the need to arrange work and methods so that each trade or gang can work as continuously as possible, allowing the men to get into the swing of what they are doing. It is impracticable and highly undesirable to hire and fire men haphazardly. The aim is also to cut down the preparation and clearing-up time at the beginning and end of each operation—a proportion that mounts the more work is split up. This requires an uninterrupted flow of materials to the site.

(*c*) Prepare overall programme. The methods having been decided, an outline picture of site operations can be expressed on a programme chart (see Fig. 2) with operations plotted vertically and time horizontally. The chart is not intended to be either detailed or exact; it is a broad plan of the order of events to come. The number of variables affecting operational procedures permit only exact and detailed planning fairly close to the events themselves. The overall programme indicates the approximate times for the delivery of materials and for the entry of sub-contractors. The contract staff then get in touch with these people—so far as they are known at this stage—to agree provisional dates.

(*d*) Now the contract staff set down the information and methods they have worked out like this:

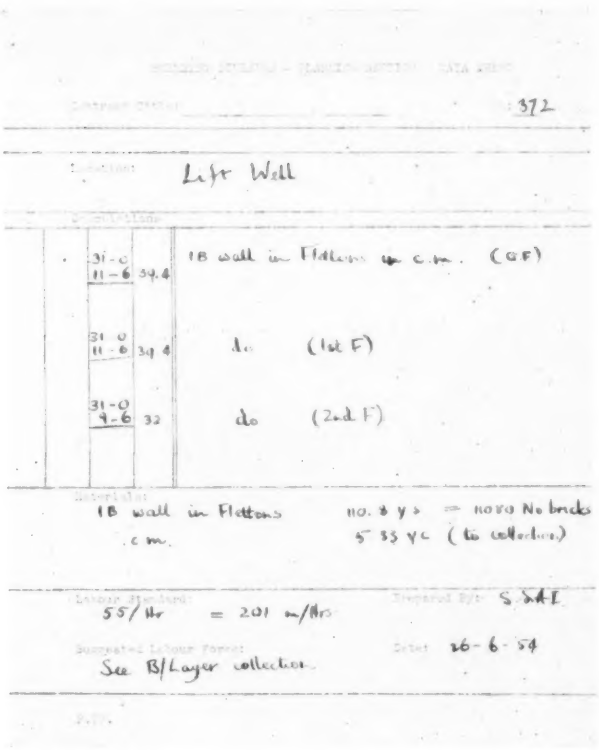
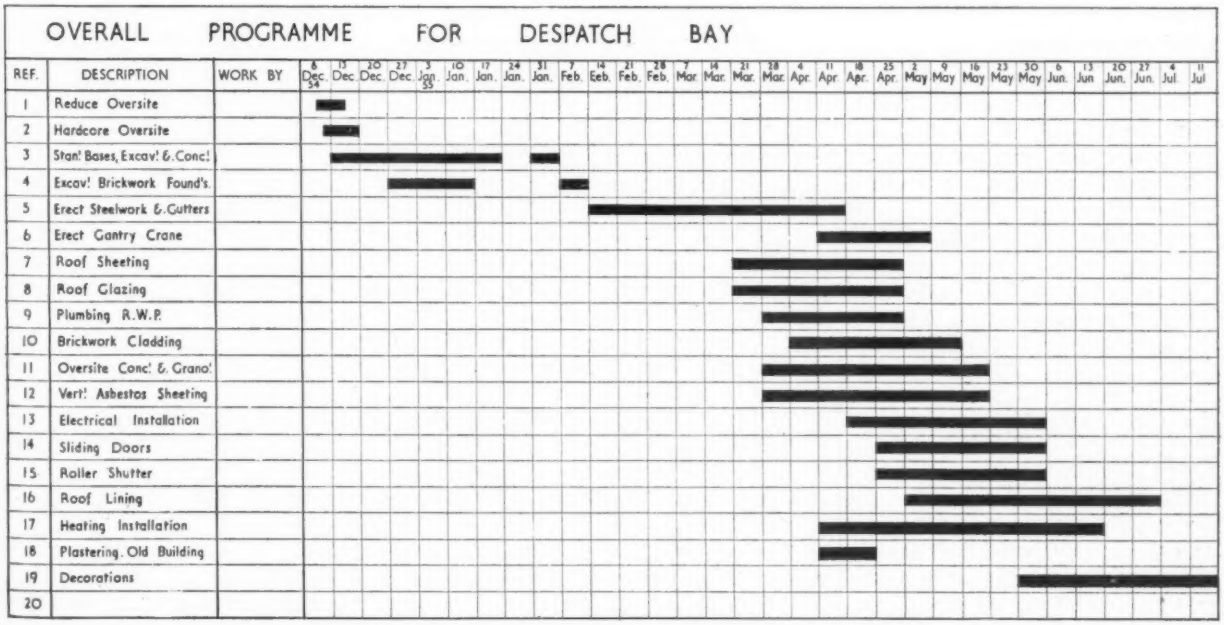


Fig. 1. Typical data sheet taken from a schedule of basic quantities.

1. The statement of methods (see Fig. 3);
2. The schedule of plant and approximate dates when required;
3. The schedule of labour requirements at each main phase of the work;
4. The schedule of huts, site offices and small tools required;
5. A cost comparison showing where the contract staff's proposals differ from those assumed during tendering; because either they have more time, fuller information

Fig. 2. Typical overall programme showing the approximate times for the delivery of materials and for the entry of sub-contractors.



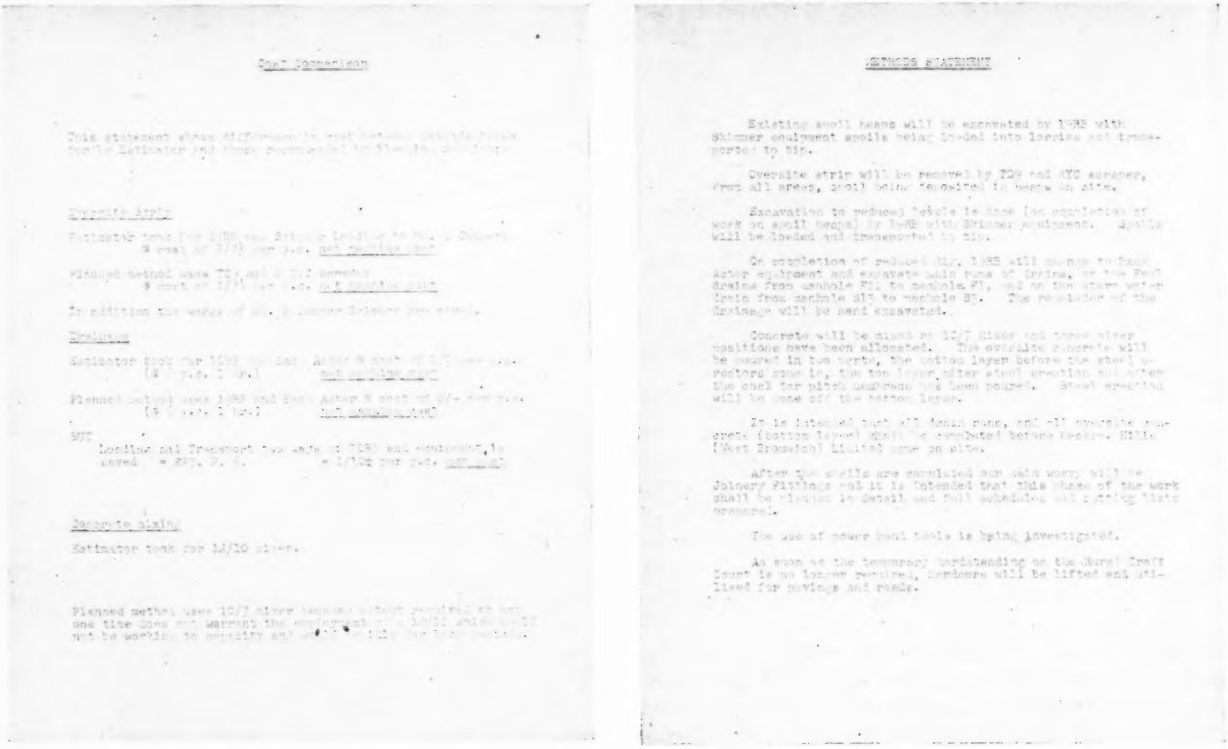


Fig. 3. Two pages from a "digest of planning data" prepared for a comprehensive school.

and changed circumstances; or because they think they can improve on the estimator's methods. (See Fig. 3).

(*e*) Prepare contract information sheet giving, among other things, names and addresses and telephone numbers of all those concerned in the contract within and outside the firm; contract particulars; items relevant to insurance, wage rates, value of the work and so forth, and the address of the nearest bank. This is circulated within the firm, for information and to save people the time of looking up the information. All this preparatory work is now presented to a final planning meeting.

Final planning meeting

The contract manager takes the chair at what is a very searching examination of the planning proposals by the general foreman, the contract staff, a representative of plant division, the firm's quantity surveyor, the estimator and the head of the buying department. The knowledge, experience, and ideas of these people is brought to bear on every aspect of the work to be done and the circumstances of the contract. They discuss methods of excavation; output rates assumed; the gearing-in to their own operations of sub-contractors; the problems of getting the right numbers of tradesmen; the positions of hoists; stacking and handling problems; phasing of materials deliveries; provision for bad-weather work, and many other factors. Amendments to the proposals will be suggested, argued and agreed for a final plan of campaign to be prepared after the meeting. If the main contract has been signed, firm orders can be placed with the nominated sub-contractors and suppliers, and delivery or entry dates agreed. If these dates later require amendment, the revised dates are issued by the general foreman from the site.

Detailed programme

The next task is for the contract staff to prepare a detailed programme to start the contract off. This shows the operational methods, and the materials and labour requirements for the first four weeks of the contract in detail. Thus, during the difficult period of getting the job under way, when the recruitment of labour is the stiffest headache, the foreman need not spend his time planning his work. In the third week of the first month, when things should be getting into their stride, he starts planning the next four weeks in detail.

COMMENT

Planning principles

We have given an account of the above-average builder preparing for work on the site. Two things about it should be emphasized: firstly, that the majority of contractors do not prepare so carefully or in such detail as this. Secondly, that those who do may not follow this particular procedure. But the jobs to be done in preparation are basically the same, whatever the methods of tackling them, and it is mainly to illustrate these that the account is given.

A number of those experienced in the industry assert that the nature of the work is such that it cannot be planned in advance; that building is vulnerable to so many uncertainties—not least the architect and the weather—that the most careful plan will sooner or later have to be discarded. But, as the foregoing account shows, a realistic plan distinguishes between those matters that can be safely decided in advance and those that must be left until nearer the event itself. For example, the general foreman is provided with accurate and complete schedules of materials, plant and tools needed on the job; he does not have to extract individual items from a bill of quantities, which would not

give the information in the form or in the sequence in which he will need it. Relieved of these tasks the foreman can attend to that part of the day-to-day work which cannot be detailed so far in advance.

How is the architect concerned

Many contracting firms are developing planning techniques that have already shown a marked—in some cases spectacular—improvement in economy. It seems likely then that the idea, and the knowledge that is accumulating, will in time filter through to the bulk of the industry. How quickly this happens will depend much on the co-operation and encouragement architects can give:

(i) by providing, at the start of contract planning, all the information that the builder needs—a full set of drawings, details of nominated sub-contractor and supplier's work;

(ii) by avoiding variations;

(iii) by allowing the builder time to work out his plan. This might vary from two to fifteen weeks, according to the size of the contract. Architect and client should be concerned less with the starting than with the completion date.

Up to the present time we have described all the steps that have been taken in the builder's head office to plan the contract as best he can with the information available. Now comes the time when the general foreman takes charge on the site and to put him completely in the picture with regard to the planning that has already been done he is handed the following information: (*a*) description of the methods of tackling the main operations; (*b*) overall programme (see Fig. 2) and site layout; (*c*) detailed programme for the first four weeks; (*d*) architect's and engineer's drawings. Together with schedules of: (*e*) basic quantities, arranged according to the main phases of work; (*f*) suppliers' orders for materials, with delivery dates; (*g*) materials requiring preparation (joinery, precast concrete, etc); (*h*) sub-contractors' orders; (*i*) plant; (*j*) huts, site offices, small tools, etc.; (*k*) labour requirements arranged according to main operations.

Since the foreman has co-operated in producing this information, he is thoroughly familiar with it; indeed it will embody much of his own knowledge and ideas; from now on the main responsibility for the contract is on his shoulders.

Phase planning

Each week he prepares a detailed programme of work for the following week—checking to make sure that the men, materials and plant will be available at the right time. In the third week of each four-weekly period he prepares, preferably in consultation with the trade foreman and the sub-contractors' foreman concerned, a further four-weekly programme which he submits to head office.

Materials delivery

For some materials, such as aggregates, bricks and cement, bulk orders will be placed with suppliers—usually local merchants—to be called forward by the foreman in quantities as needed. Materials such as metal windows or reinforcement will be delivered automatically (all being well!) on dates arranged during the planning stage. Adjustments to the plan of operations which affect these dates are notified to head office and the supplier, and the various schedules listed above are amended.

Sub-contractors

A fortnight or so before a sub-contractor is due to come on site, the foreman will get in touch with his representative to confirm the previously-agreed date and to discuss preparations and attendance. Large items of attendance such as scaffolding will have been arranged in contract planning, but small items such as cutting holes and providing ladders, etc., are arranged on site.

Progress

The overall progress of the work is regularly reviewed by the contract manager, architect and foreman at site meetings, particularly if there is a substantial change of plan. If certain operations take longer or shorter than the planned time, or for local reasons they are done in a different way from that planned, the effect on subsequent operations is taken into account. The foreman will, in this case, notify the contract manager who may call on the contract staff to replan the work. Such a change would require a revised schedule of sub-contractors' and suppliers' dates.

Bad weather work

The foreman must be prepared to transfer his men from work affected by frost when the temperature drops or from work in the open when it rains. Bad weather can seriously upset the economy of labour output unless there is an alternative job for work gangs and a method of tackling it already worked out.

In addition to this particular responsibility with regard to site planning, and to fill in the picture of what is entailed in running a contract, we now give a list of many of the other tasks and problems that a general foreman has to deal with.

Labour

It is unusual for more than about 5 per cent. of the men on the site to be permanent employees of the builder. These are the key men, general foremen and trade foremen for the main trades, bonus surveyor and wages clerk. The rest are engaged for that one contract, usually local men obtained through the local labour exchange. Where men are not available locally they are "imported," the builder providing transport and paying them for travelling time. There is a larger turnover of labour at the start of a job, while those who are suitable and want to stay are settled in. The foreman spends a good deal of his time interviewing men.

Wages

On a large job away from head office the calculation of wages may call for a full-time clerk on the site. Time sheets are kept showing the hours worked. To these figures, overtime and plus rates (tool money, etc.) are added where appropriate, National Insurance and Income Tax deductions made and paid in. An account for the job will be opened at the local branch bank. Before any overtime can be worked, permits must, under the Working Rule Agreement, be obtained from the Regional Joint Committee for the area.

Bonus and costing

The pattern of the bonus scheme—target rates and so forth

—will have been arranged by head office. The bonus surveyor measures the work done each day, and his calculations are passed on to the wages clerk for the amounts earned to be included in the weekly wage.

Welfare and safety

The general foreman must be responsible for the following:—provision of canteen facilities, mess huts, drying huts, tea breaks, protective clothing, accident prevention and treatment, maintenance of hoists and scaffolds in accordance with safety regulations. The latter are governed by provisions in the Factories Acts which require a competent person on the site to see that regulations are observed, to meet the inspector when he visits the site, and to record the visits.

Reports and diaries

Each day the foreman makes up his diary of events, recording: men taken on or paid off, the state of the weather, orders and queries requiring confirmation by the architect. This is sent to the contract manager. Each week the foreman makes out a report on progress and sends this to the contract staff to mark up on their copy of the progress chart, to compare with what was planned.

Drawings : variation orders

Drawings, variation orders and architect's instructions coming to the site must be acknowledged and registered, and the data from which the foreman is running the job must be amended accordingly.

Valuations

The foreman must give some of his time to the client's quantity surveyor when he visits to value for certificates; and to the firm's own quantity surveyor when he comes to value sub-contracted work and materials supplied, for payment. The accounts of local suppliers and sub-contractors are settled by the site staff.

Official site meetings : visitors

Meeting of foreman, sub-contractors, architect and perhaps consultants can take the best part of a day and require much preparation of information and query lists. A good deal of time will be spent attending to visitors, many of whom will arrive on site without appointments.

Apprenticeship

The foreman has a special responsibility to see that craft apprentices are given work appropriate to their training and capabilities and in accordance with their deeds of apprenticeship.

Clerk of Works

Part of the foreman's time is spent in attendance on the clerk of works when he inspects the work and requires information on labour strengths, materials, deliveries and so forth to complete his reports to the architect.

Testing materials

Concrete cubes for crushing strength tests, slump tests, aggregate tests and the like must all be prepared at the direction of architect or engineer.

All in all it will be seen that the general foreman's job is no sinecure.

COMMENT

The purpose in presenting this account is to show that a well-run building site is a complicated and highly co-ordinated organization. Everything depends on there being (*a*) a clear understanding of the work that lies ahead, (*b*) the materials, plant and men available in the right quantities and numbers at the right time, (*c*) sub-contractors equally well organized on the right dates. The uncertainties in maintaining these three factors are obvious—suppliers may fail with delivery dates, plant may break down, it may be impossible to get tradesmen or assemble work gangs in the designed proportions for a particular task, sub-contractors may fail to turn up or gear co-operatively with the rest of the work, the weather may break, or the architect may delay his instructions or change his mind.

We have already shown how careful preparations by the builder's own organization can go a long way to reduce or mitigate these uncertainties. Preparation to this degree has proved possible and fruitful in practice. If the majority of contracting firms developed similar techniques, adapted to their own circumstances and type of work, it would be a major contribution to reduction in the cost of building.

The building industry is still a craft industry and both operatives, and in many cases supervisory staff, are trained only in traditional methods and have been brought up to think that there is only one way of performing a particular task—the way of their fathers. There is a need for a much more questioning attitude to methods in all branches of building work. This attitude in its most highly-developed form would entail the technique of method study so that the performances of various methods of achieving the same tasks may be expressed in comparable terms. Method study developed to this degree requires, of course, special training and experience which one could hardly expect from those steeped in the traditions of the industry.

There is a strong case then for training a proportion of young men, who aim eventually at supervisory positions, in these techniques. Nevertheless, the industry could make far more use than it does of the knowledge and skill that is already available; from work at BRS, from advisory services such as that offered by the NFBTE and from private management consultants. Use of such knowledge can achieve a more economical use of men and machine hours and is surely in the builder's own interests.

Incentive schemes are designed to enable operatives to increase their earnings by increased production. In building, these schemes have not enjoyed the success they seemed at first to promise or the results that have been achieved in other industries. It is essential for their success that the target output rate shall be based on economical methods of tackling the work—carried out in a planned environment with materials and tools to hand, so that operatives may feel that nothing outside their control prevents them working at their best. Clearly, this implies the need of good progressing, co-ordination of materials deliveries and so on. But it also implies, and this is where the architect is involved, a constructional design where each operation is straightforward and is interrupted as little as possible by other operations. For example, it is easier to bonus brick walling in simple panels than walling that has many angles, openings, offsets or decorative features. This is a clear instance of the relationship—too little recognized by architects—between aesthetics and construction processes.

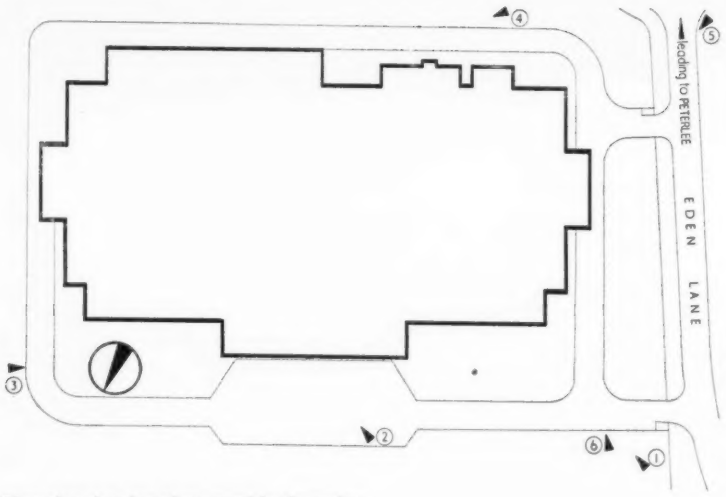
FACTORY

on the PETERLEE INDUSTRIAL ESTATE, CO. DURHAM
designed by WILLIAM HOLFORD and PARTNERS,
assistant architects, G. C. GARDINER, C. R. WILSON, P. A. NOTTINGHAM,
assistants, D. CHAKARAVATI, T. V. MURRAY, K. R. TOWN
quantity surveyors, T. HERDMAN RAE and PARTNERS
consulting engineers, heating and electrical, CAIRNS and BYLES

The Jeremiah Ambler Mill, completed in September, 1954, is the first factory to be built on the industrial estate of the new town of Peterlee. The mill is concerned with the production of quality yarn, and an air-conditioning plant has been installed. Multi-storey buildings are usual in this industry, but the parallel production lines of the single-storey mill achieve economy by cutting the use of trolleys and hoists to a minimum. The district is heavily undermined, and a seam 8-900 ft. below ground level is to be cut under the site within the next 12 years. This has resulted in the factory being built with a flexible structure to allow for earth movements, and the National Coal Board, who advised on structural precautions, are to make good any damage due to mining subsidence. The general contractors, Bovis Ltd., were appointed to construct the factory on their cost-plus contract. For sub-contractors see page 373.

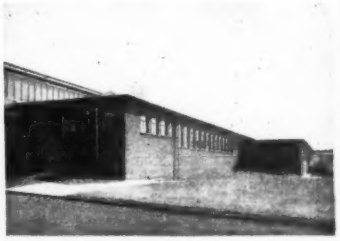
The south facade from viewpoint 1.



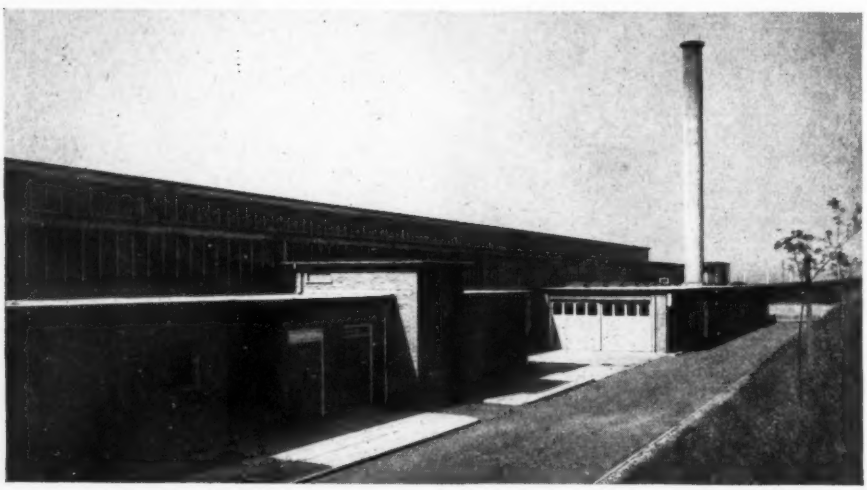


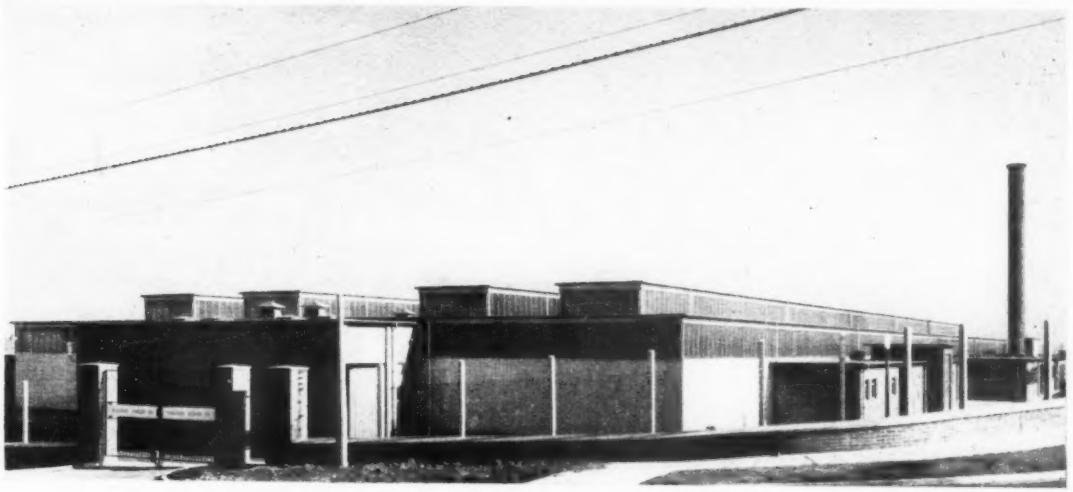
Key plan showing photographic viewpoints





Above: the main entrance, seen from viewpoint 2, is situated in the centre of the north elevation. It leads into the entrance hall, with direct access to the offices, the laboratory, the mill workers' accommodation and the mill itself. All window frames are aluminium sections. Movement joints can be seen on the right of the entrance. They are $\frac{3}{4}$-in. wide, filled to a depth of $1\frac{1}{4}$ in. with non-hardening mastic. Internally the walls are plastered, and a V-joint is made with a concealed expandable copper flashing. The canopy is supported by a welded steel frame, on two 3-in. steel columns, and stabilized by the lintol over the entrance. The underside of the canopy is faced with t. and g. clear-varnished ash boarding, and its roof is bituminous felt with copper flashings. Above: viewpoint 3, with the main entrance on the extreme right, and the mill workers' entrance to the left of it. The entrance on the extreme left is to the canteen kitchen. Junctions between the brick ancillary blocks and the steel-framed, aluminium-clad mill, have been kept structurally separate throughout. Each type of structure is on its own foundation. The rocking movement which the mill steelwork has been designed to take up, should subsidence be appreciable, could cause gaps between the steel and brick structures, and 3-in. overlapping flashings have been provided at all junctions to maintain the seal. Below: from viewpoint 4, the south elevation; the single-storey brick blocks house the services. The right-hand block contains the fuel store, the boiler house workshops and a maintenance garage. To the left of the boiler block is the Electricity Board Sub-Station which will be capable of supplying several other factories on the estate. The block on the extreme left houses a 6,000 gallon water tank for the sprinkler system installed throughout the factory.

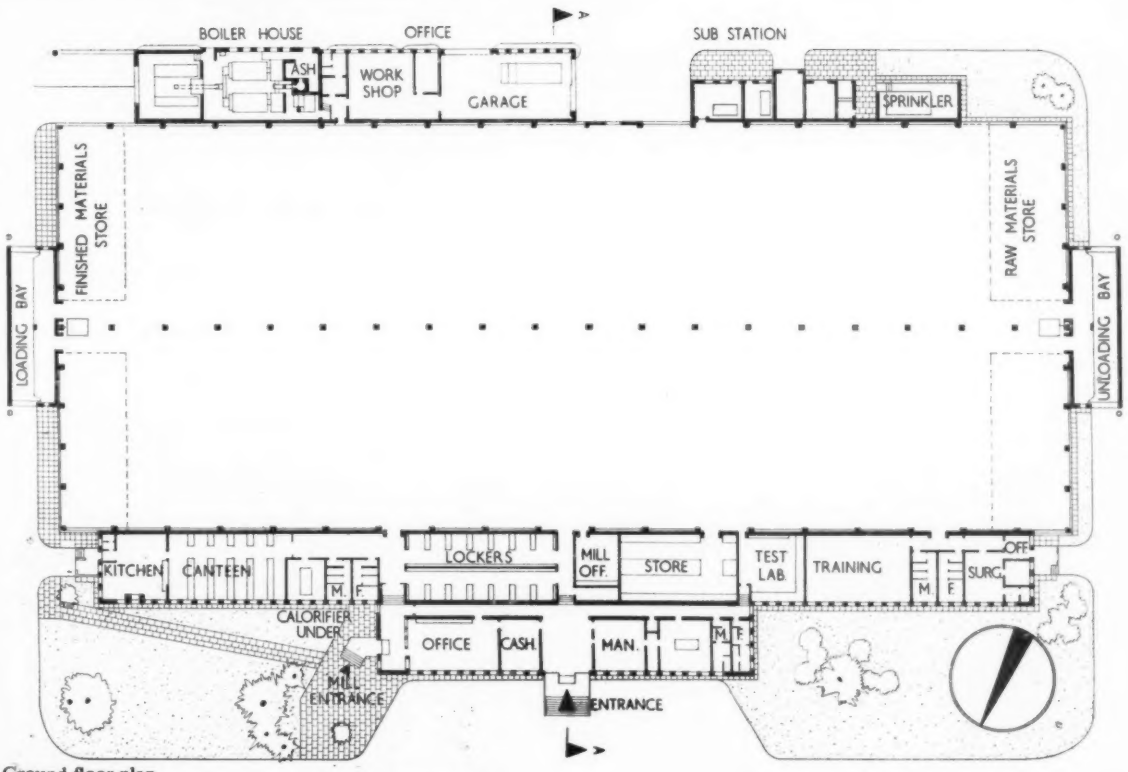




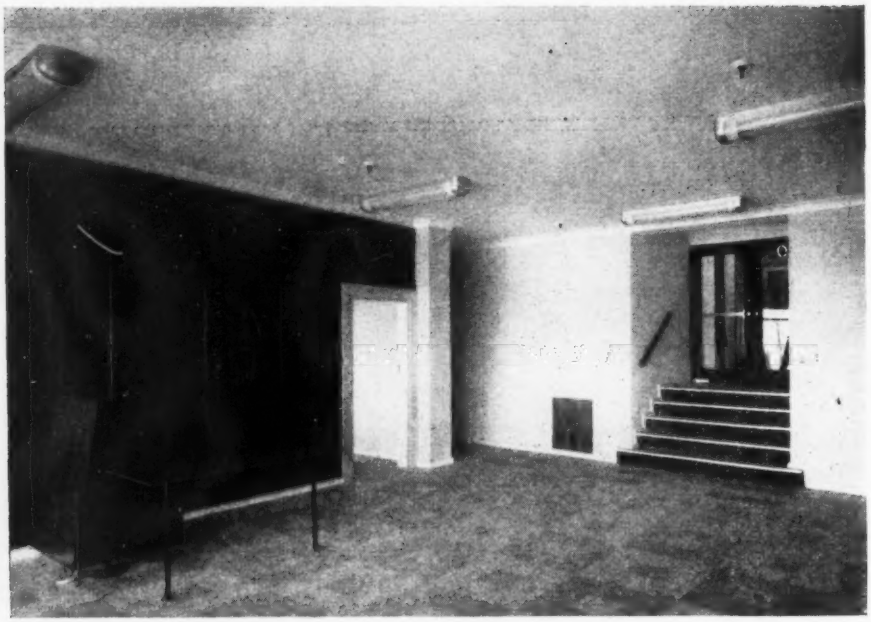


Above from viewpoint 5 is the southern entrance from Eden Lane and monitor roof-lighted mill beyond. To the right are the ancillary service blocks. Left: from viewpoint 6, the mill unloading bay, identical to the loading bay at its opposite end, and independent of the steel structure. It has brick walls on all sides with door openings into the mill. The usual air-conditioning seal of double doors could not be applied, so the bay has been made air-tight and the power-operated sliding folding doors are opened only for dispatch of goods; each bay having a small crane. The canopied door in the foreground leads to the surgery and rest room, providing at the same time an emergency exit from the mill.

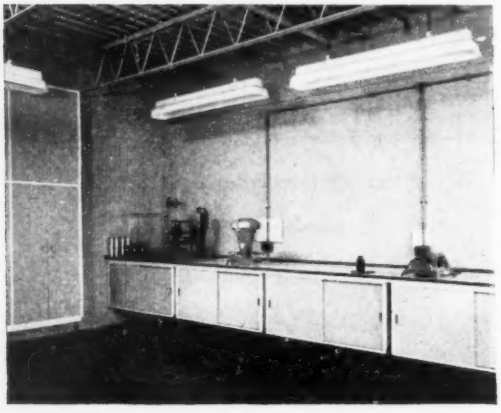
FACTORY AT PETERLEE NEW TOWN



Ground floor plan

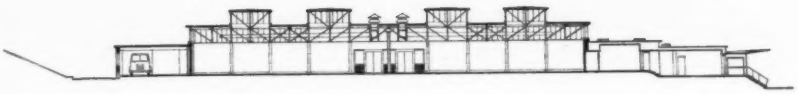


The main entrance hall, above, provides a waiting space for visitors and permanent housing for the telephone switchboard. It is heated by L.P.H.W. tubes embedded in the floor. The side walls are lined with ebony veneer panels, inlaid with a decorative motif by Colin Wilson, and the floor finish is thermoplastic tile. The laboratory, with quarry tile floor, below, is situated in the administrative block, and is one of the rooms without a false ceiling. The blue-painted lattice beams (Munsell 5.0 B7/4), at 5 ft. centres, carry aluminium roof decking, topped with ½-in. insulation board and 3 layers of roofing felt. All walls are painted with grey emulsion paint, and doors are painted with Saxe Blue high-gloss oil paint (Munsell 2.5 PB 3/8). The main canteen, bottom, is planned to eventually accommodate 100 persons. It provides a cafeteria service from the hatch at the far end. The canteen ceiling is pale blue, the walls grey and the kitchen door crimson. The yellow hatch is set in vertical cedar boarding. The view of the general office, below, is from the mill entrance door. The office is painted with emulsion paint—a grey-green end wall (Munsell 2.5 GY 6/2) and remaining walls off-white. The timber framing and vertical cedar boarding have been treated with a linseed oil solution and the panel above the door is painted deep blue. Finger plate and kicking plate are laminated plastic and floors are thermoplastic tiles.



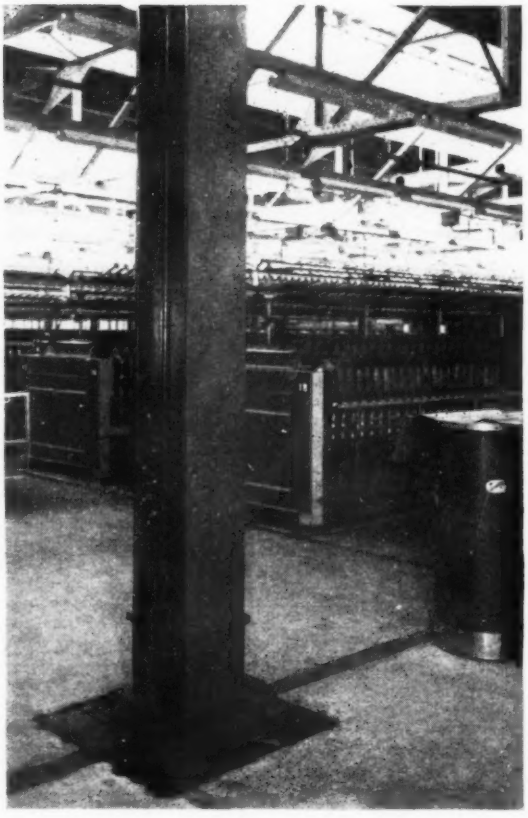






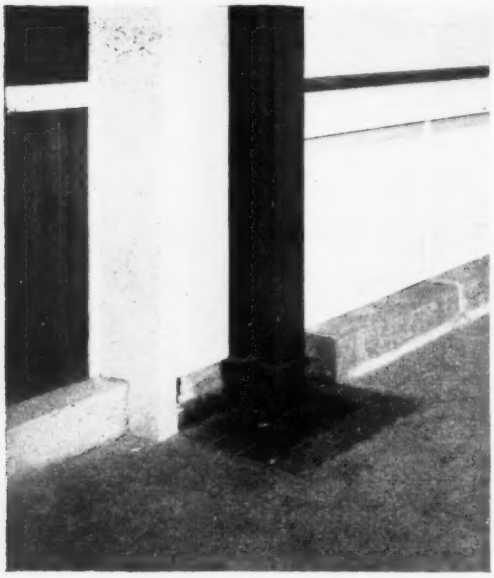
Section A-A

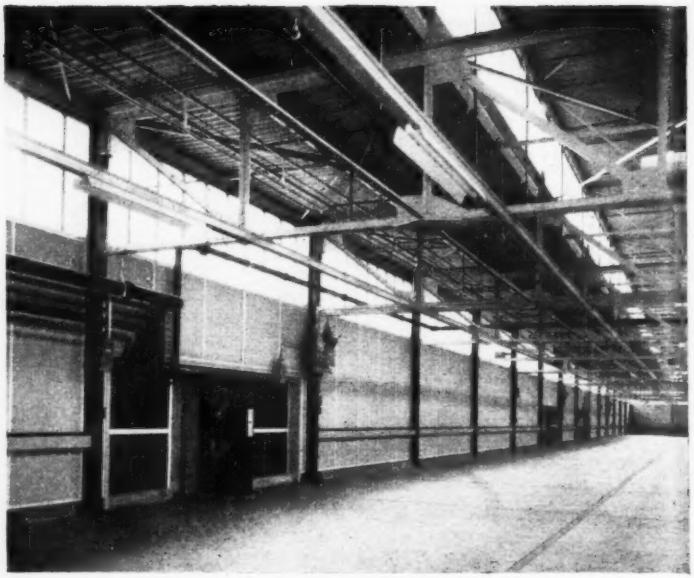




FACTORY AT PETERLEE NEW TOWN

Above: general view of the mill. Bays are 76 ft. by 20 ft., and each truss carries two 15-ft. wide by 7-ft. high monitors, providing north and south light. All the structural components and service installations have been allocated separate colours thus articulating the many members in the roof space. The principal colours are primrose for the steel trusses (Munsell 2·5 GY 8/6), romney blue for the steel purlins and ties, blue grey for the stanchions (B.S.S. 633), windsor grey for the wall panels and lacquer red for the roof decking fixing members. The central row of 10-ft. by 10-ft. broad flanged columns, left, are pin-jointed at the base, and sit on a rocker plate, allowing movement during mining subsidence. Special details which have been designed for these conditions include (i) a raised concrete foundation enabling all the steelwork to be accessible above floor level. (ii) a 1¾-in. steel plate, which distributes the point load from the rocker on to the concrete foundation. (iii) 2-in. rocker plate with its underside curved to a 9-in. radius. (iv) A ¾-in. stanchion base plate welded to the B.F.B. (v) A bolted splice with two ½-in. plates, at a position 9 in. above the stanchion base plate, into which packing can be inserted should the soil movements exert a lifting action on the column. (vi) Holes for jacking, should the need arise for packing to be inserted.

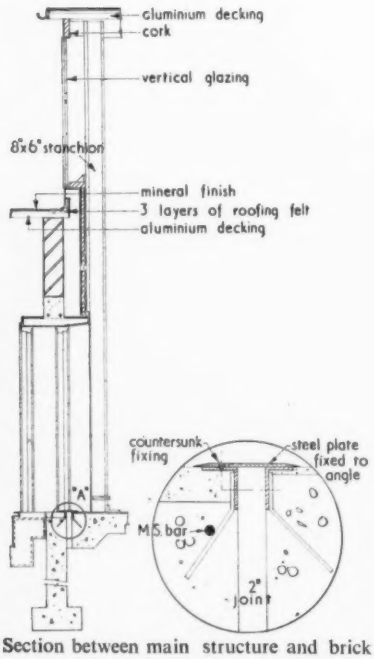




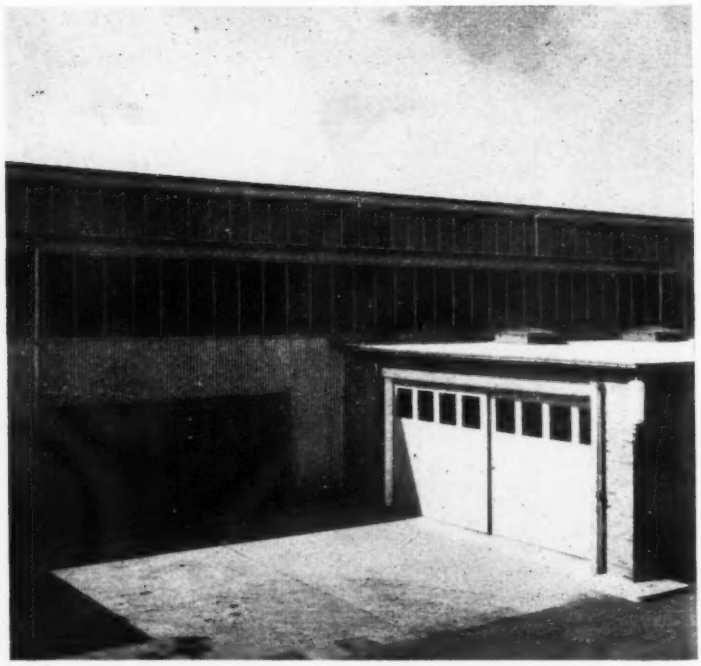
Above left, the 8 in. by 6 in. by 35 lb. R.S.J. side columns take up any movement on steel roller bearings. The rollers are in a grease-packed box, the top of which is level with the finished floor level. Details above floor level are similar to those already described for the central columns. For detail drawings of these columns see page 363.

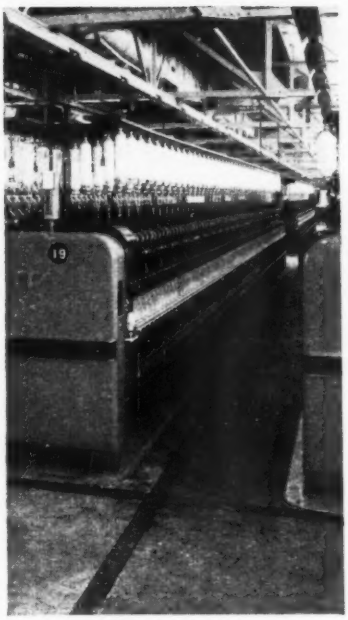
Above right, factory walls are internally clad with hardboard-faced compressed-strawboard, painted grey with emulsion paint. A 7-in. cavity between strawboard and external aluminium sheeting gives a U-value of 0·13. The clerestorey and monitor lights are double-glazed patent glazing, with the outer sheet of georgian wired glass, and the inner of ¼-in. roughcast glass. The factory door openings have mesh reinforced, breeze hoods with a plaster finish. These hoods are part of the ancillary block brick structures and ensure that the doors cannot be lifted from the floor level even if there is an appreciable movement in the steel rocking frames of the mill.

On the south side, by the garage block, there is direct access to the mill. A brick wall panel on an independent foundation contains the doors, and flashings permit 3-in. difference in movement between the structures.



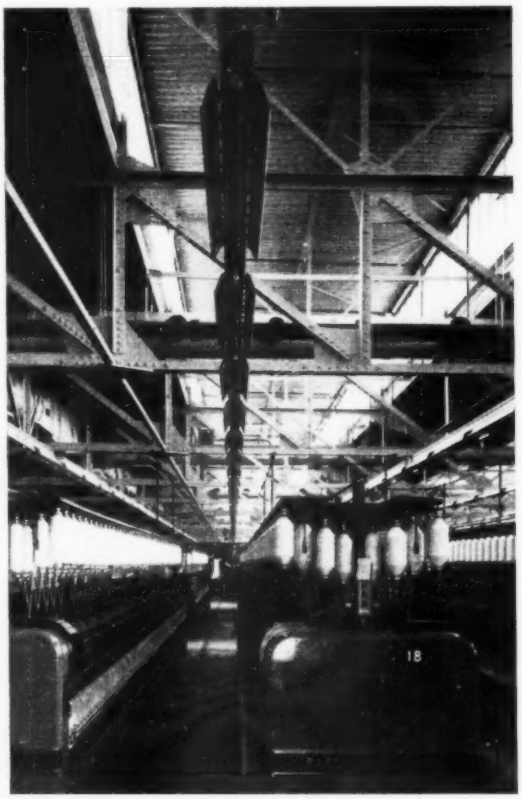
Section between main structure and brick ancillary block showing movement joint in floor slab.

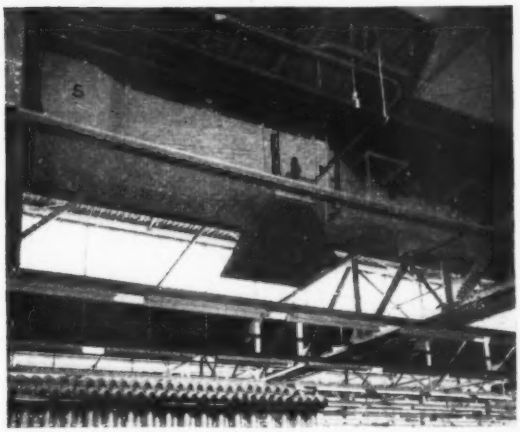


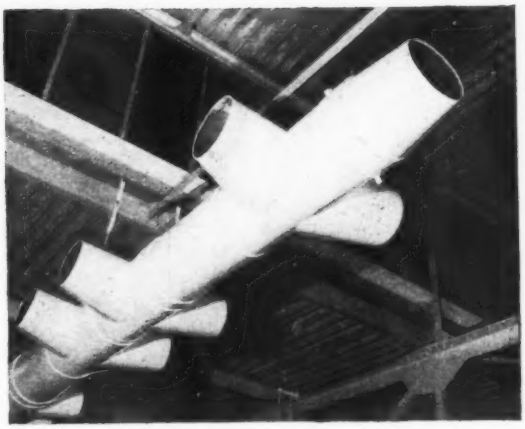


Above: the mill floor slab has been laid in bays of 38 ft. by 20 ft., with joints between adjoining bays, dimensions having been determined by the sizes of the spinning machines. There is a ½-in. granolithic floor finish, and joints are masked by 6-in. × 3-in. × ½-in. rebated quarry tiles, set in mastic.

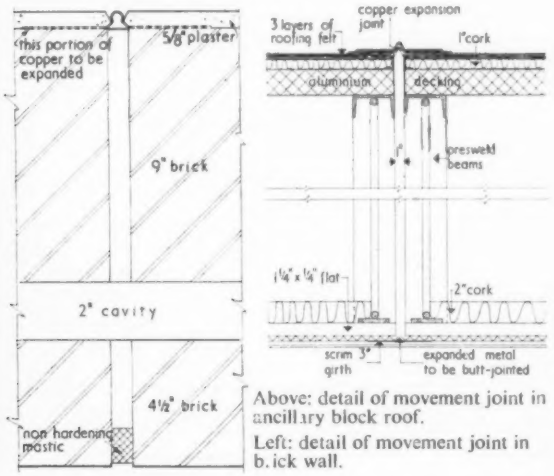
FACTORY AT PETERLEE NEW TOWN







Eighteen air-conditioning units were installed instead of a single centralized plant because of (i) economy, (ii) the chances of extensive breakdowns would be lessened, (iii) humidity variation in different parts of the factory could be easily achieved. Top: one of the air-conditioning units. Fresh air is drawn through roof openings and passes through the filter box to the heater battery. It is then propelled by axial flow fan through the humidifier to be discharged across the factory. In cold weather re-circulated air is drawn through the suspended " fly " filter, keeping the heater battery free from lint. Viscous filters are situated in the four drawers of the unit. Above: a photograph of the overhead circulation system. Left: the mill is artificially lighted along the production line aisles by 5-ft. long, 80w. warm-white fluorescent tubes, with aluminium reflectors, and set in trunking which allows varied light intensity at any position along the line.



Above: detail of movement joint in ancillary block roof.

Left: detail of movement joint in brick wall.

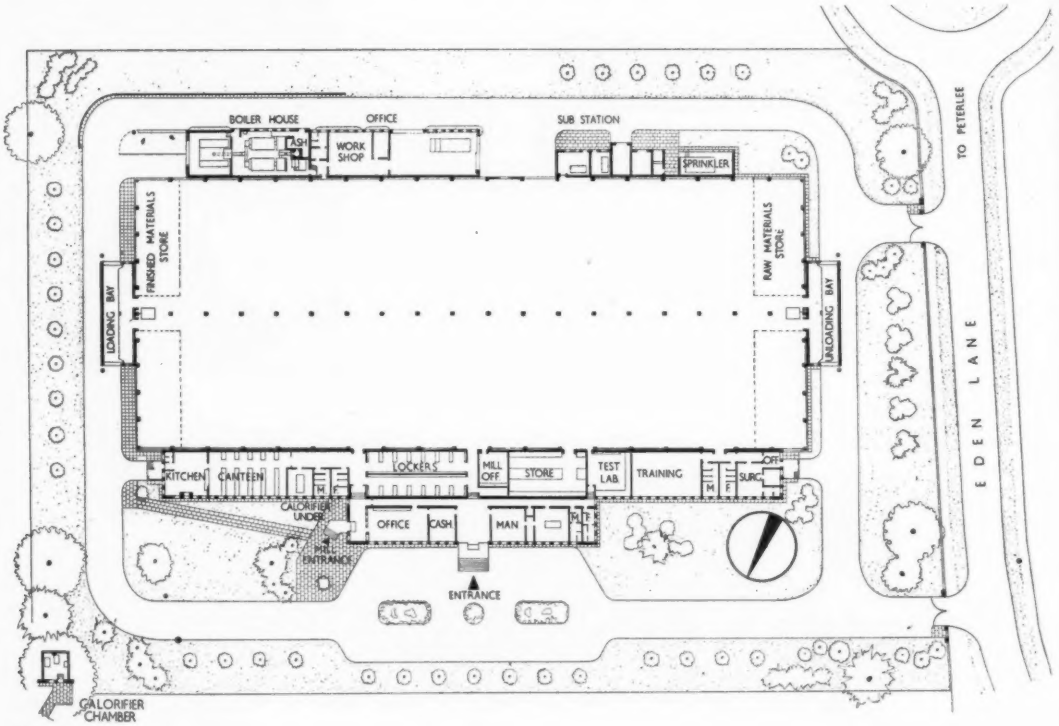
FACTORY AT PETERLEE NEW TOWN

CLIENT'S BRIEF: his stated requirements

The North Eastern Trading Estates Ltd., for whom the factory was built, required a factory with a clear lettable floor space; structure to have approximate economic life of 50 years. Jeremiah Ambler Ltd., to whom the building was to be leased, required a controlled atmosphere for their yarn spinning process. Floor area to be 57,000 sq. ft. and minimum column interference to the production lines. A raw material arrival bay at one end of production lines, and a finished product despatch bay at the other. The mill to be air-conditioned, and sealed with an appropriate degree of insulation. Other accommodation to provide for welfare, production, management, and services

SITE: topography, surroundings, access, planting

The site, on the Peterlee Industrial Estate, is situated on the northern fringe of the new town. There are two entrances to Eden Lane, a secondary road, which runs south to Peterlee and north to the main Sunderland, West Hartlepool Road. There is an average slope of 1 in 12, running across the shorter axis of the factory, with a fall to the north. This has necessitated a considerable amount of site work. The district is heavily undermined, and substantial site movements in the next few years are predicted. The clients possess their own gardening department, and landscaping to the architects' design has begun. This comprises the planting of lawns and trees, including ash, silver birch, copper beech, weeping elm, flowering cherry and clumps of berberis



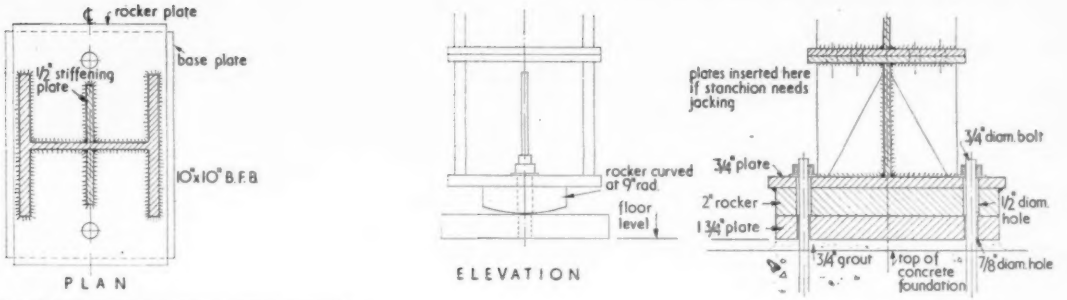
Site plan

PLAN: general appreciation

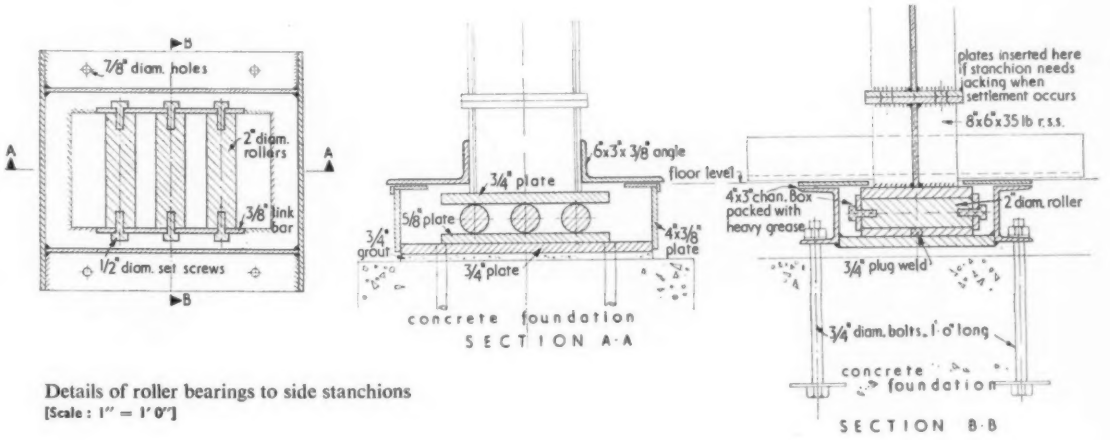
The factory includes a single unit, rectangular-shaped, monitor-lighted mill with ancillary accommodation in single-storey blocks along the longer sides of the mill. The mill has been planned for eight parallel production lines with the unloading and loading bays situated at the ends of a conveyor belt process. Circulation to the mill is from the north side, along which the workers facilities, and the administrative and executive offices are situated. Blocks on the south side of the mill house the maintenance and service plant

MAIN CONSTRUCTION: general appreciation

The foremost problem in designing the factory was how to accommodate the structure to probable large soil movements. The architects' solution provides a row of frames, each of which can take up movement from its central pivot. The individual frame consists of a continuous truss supported on three columns, with the centre column pin-jointed to the ground on a rocker plate, and the external columns taking frame movement on encased rollers. The frame can therefore adjust itself to any form of see-saw action. Should the soil movements lift any column from its bearings, provision has been made to enable it to be restored to its foundation by the insertion of packing into unbolted splice plates. The narrow brick ancillary blocks, which adjoin the longer sides of the factory, are structurally independent of the mill steel frames. Their relatively small spans permit them to resist the soil movements by the use of conventional jointing and adequate overlapping flashing.



Details of roller bearing to centre stanchions
[Scale : 1" = 1' 0"]



Details of roller bearings to side stanchions
[Scale : 1" = 1' 0"]

MAIN CONSTRUCTION

Load bearing element	*Location*	*Beam spans*	*Column grid*	*Reasons*
m.s. frame	Main floor area of mill	76 ft.	20 ft.	Main span halved in view of future settlement
Brick cavity walls	Ancillary blocks	25-ft. lattice beams	5 ft.	Economical, lightweight

Foundation type	*Location*	*Sub-soil*	*Depth*	*Reasons*
r.c. with raised piers	Stanchions	Boulder clay with sand seams	Varying with sub-soil	Concrete piers to bring stanchion bases up to floor level
r.c. beams	Cavity walls			

Outer wall type	*Location*	*Material*	*Finish*	*Reasons*
Non-structural cladding	Mill	Aluminium, 7-in. cavity, 2-in strawboard	Corrugated	Dry cladding chosen to ensure speed in enclosing mill floor for delivery of machines, for good insulation, lightness in hanging on steel structure, and ease of replacement if damaged in structural settlement
Load bearing cavity wall	Ancillaries	Brick	Rustic facings	

Roof type	*Location*	*Material*	*Finish*	*Reasons and comments*
Metal deck	Mill	Aluminium, felt vapour barrier, 1-in. cork	3-layer felt and granite chipping	Metal deck for lightness, speed and insulation
Metal deck	Ancillaries	Aluminium, insulation board	ditto	
Suspended slab	Sub-station	Concrete 1 : 2 : 4	ditto	

Floor structure type	*Location*	*Materials*	*Finish*
Solid: bays 20 ft. wide up to 40 ft. long	Mill	9-in concrete reinforced top and bottom	½-in. grano laid directly on green concrete and finished with powerfloat
Tiles	Offices, halls, etc.	Thermoplastic	
Tiles	Laboratories	Quarry	

Internal wall type	*Location*	*Material*	*Finish*	*Reasons*
Panel	Mill	Strawboard	Hardboard with emulsion paint	Speed of erection, lightness, high insulation. Hardboard face to protect strawboard
Plaster	Offices			

Ceiling types	*Location*	*Material*	*Finish*	*Reasons*
Suspended	Offices	Plaster on expanded metal	Emulsion paint	Used to combine with panel heating in offices

ARTIFICIAL LIGHTING

Source and fitting type	*Location*	*Illumination level*	*Quality*
Fluorescent	Fixed to continuous trunking on underside of trusses	15 ft. c.	Warm white
Fluorescent	Offices	10 ft. c.	Warm white
Tungsten	Garage, workshop lavatories		

Wiring and switching types	*Location*
Multiple phase I.C. switches, V.I.R. wiring	Mill
5-amp. I.C. with flush BMA plates, slow break A.C. type	Offices

Power supply type	*How distributed*	*Comments*
300 amp. t.p. & n. plug in busbars totally enclosed	In continuous cross trunking	Spaced for machine layout

NATURAL LIGHTING

Wall glazing	*Location*	*Reasons and comments*
Double patent glazing	Side wall	To avoid condensation in the high humidity conditions

Roof glazing	*Location*	*Reasons and comments*
Double patent glazing	Monitors	To avoid condensation and give higher insulation

THERMAL INSULATION

Type	*Location*	*U-value*
Strawboard, cavity and corrugated aluminium sheeting	Mill	0·13
1-in. cork and vapour barrier	Mill roof	0·21
½-in. insulation board	Office	0·32
2-in. cork	Above panel heating	0·16

HEATING AND VENTILATION

Heat exchanger type	*Location*	*Criteria temperature*	*Air change rate*	*Reasons*
Steam coil in a.c. units	Throughout factory	65° F.	Variable with weather	a.c. necessary to maintain correct conditions
Low pressure h.w. radiators	Ancillaries	65° F.		
Low pressure panel in ceiling or floor	Offices, entrance hall and cloakrooms			
Steam radiators	In garage and workshop	60° F.		

Boiler type	*Heat load*	*Fuel type*	*Stoking method*	*Reason for choice*
Two treble pass solid fuel	Each 2,300 lb. steam per hour	Coal	Elevator feed to stoker hoppers	Coal store below ground. Easy control by one boilerman

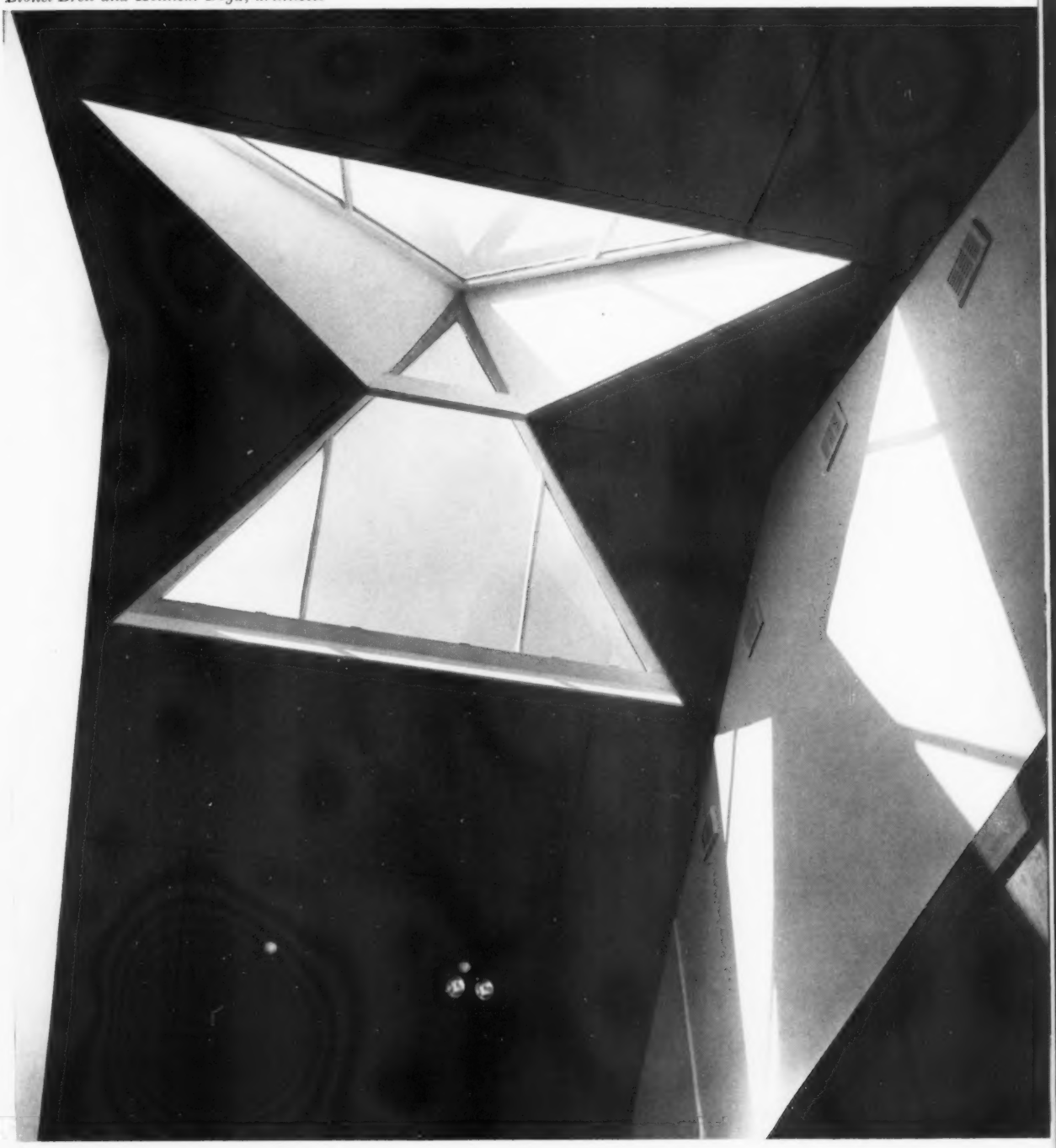
Water heater type	*Location*	*Fuel type*	*Reason for choice and comments*
Horizontal calorifier for l.p. 825,000 BTU/hr.	Calorifier room	Steam	Connected to steam mains
Gas boiler	ditto	Gas	For summer use



Architects' Journal 15.9.55

ROOFLIGHT: COMMUNITY HALL AT HATFIELD

Lionel Brett and Kenneth Boyd, architects

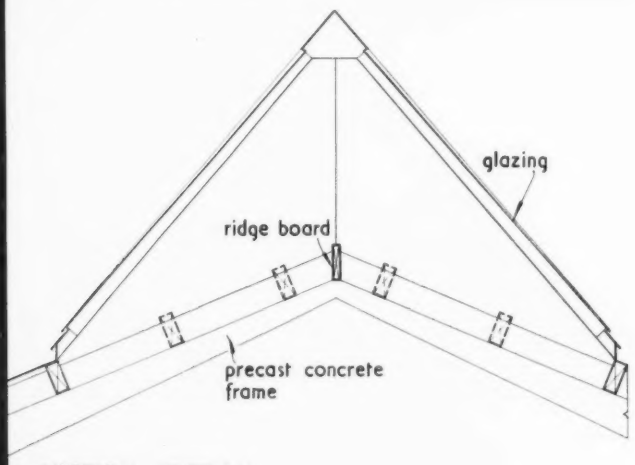


A lantern light with glazing at 45° has been contrived over the ridge of a 22½° pitched roof. The ridge board of the roof penetrates the framing of the lantern and is visible from below. The lantern is sheathed in super-purity aluminium to match the patented "clip-on" type aluminium covering used on the main roof. The object of the designers was to obtain a structure which, while giving a large glass area, would be light in weight but very strong.

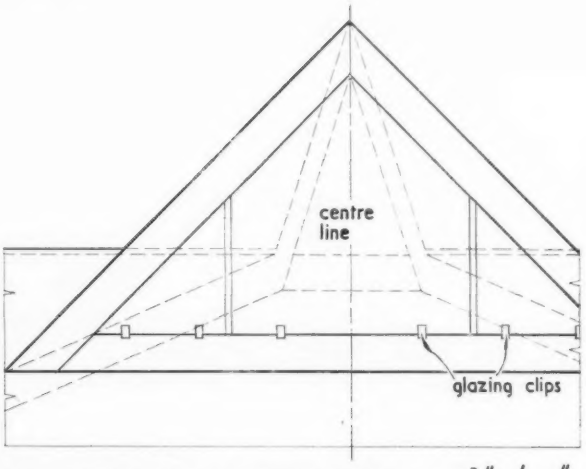
WORKING DETAIL

ROOFLIGHT: COMMUNITY HALL AT HATFIELD

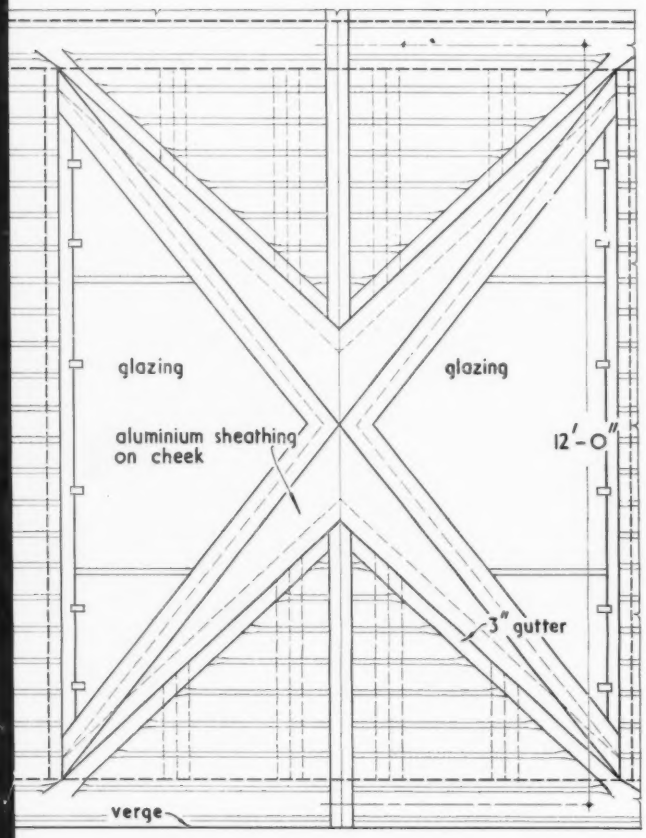
Lionel Brett and Kenneth Boyd, architects



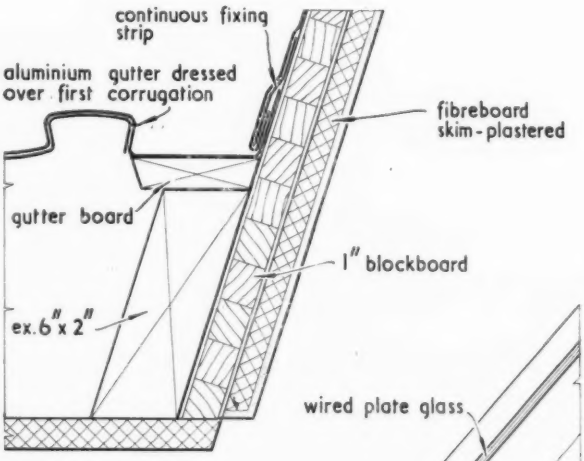
VERTICAL SECTION.



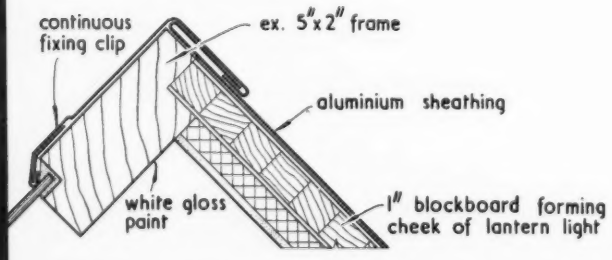
PART ELEVATION OF LANTERN LIGHT. scale $\frac{3}{8}'' = 1' - 0''$

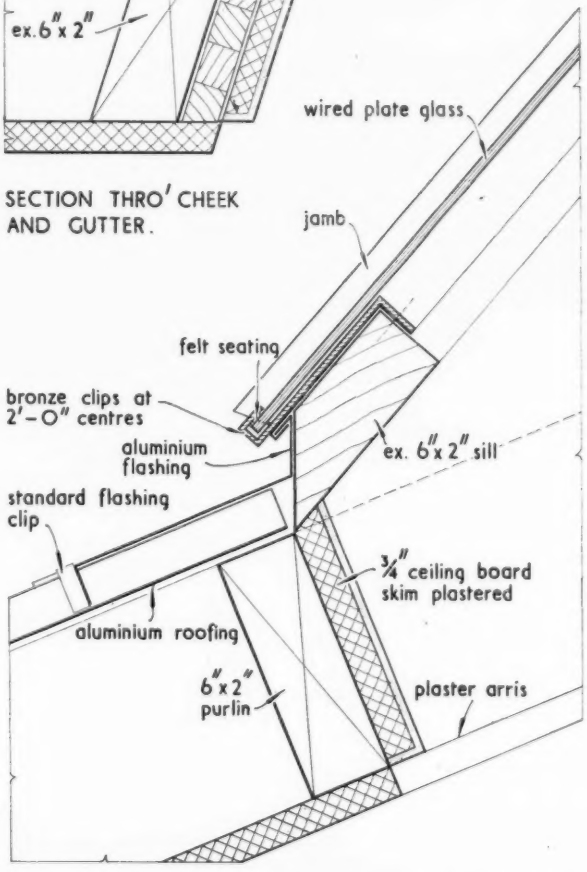


PLAN OF ROOF LANTERN LIGHT. scale $\frac{3}{8}'' = 1' - 0''$



SECTION THRO' CHEEK AND GUTTER.





VERTICAL SECTION THRO' SILL OF LANTERN LIGHT.

WORKING DETAIL

COVERED WAYS AND CANOPIES: 14

CANOPY : SCHOOL AT CATFORD, LONDON, S.E.6

J. L. Martin, Architect to the London County Council; S. F. Horsfall, Assistant Schools Architect; W. J. Smith, architect-in-charge



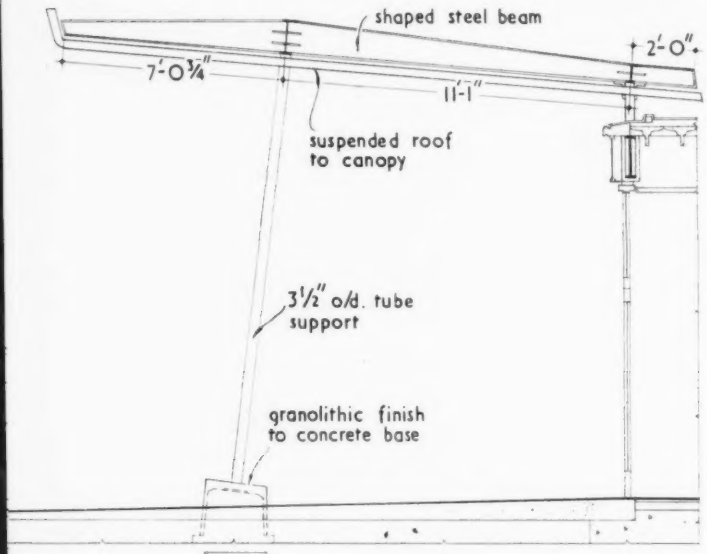
The framework of m.s. sections which supports the underslung decking of the canopy was shop-fabricated in three parts. The three shaped beams which run down the length of the canopy were fabricated with offsets at two points which were subsequently bolted together on the site to form a grid on plan. The tubular supporting columns were fabricated in two parts: the top nine inches of each is welded to the grid and is held in position over the main section of the column by means of an internal sleeve and tapped screws.

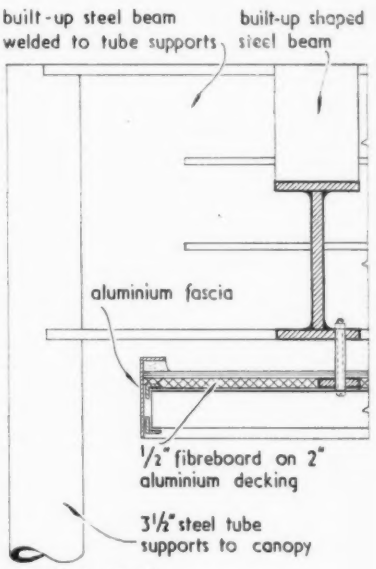
Architects' Journal 15.9.55

WORKING DETAIL **COVERED WAYS AND CANOPIES: 14**

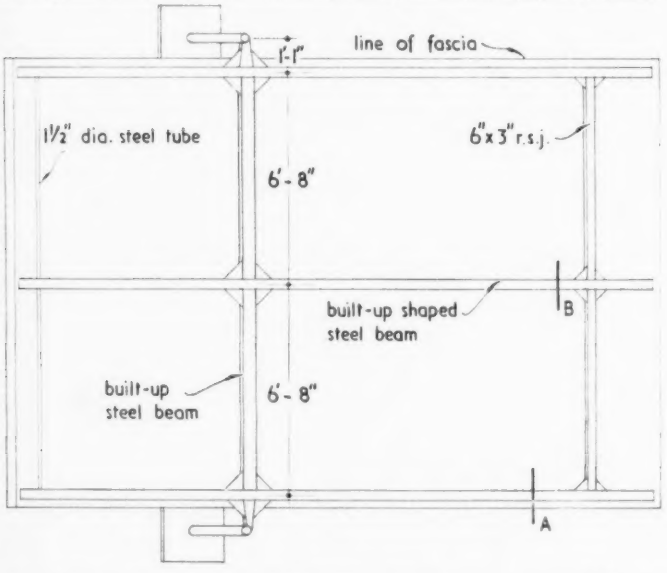
CANOPY: SCHOOL AT CATFORD, LONDON, S.E.6

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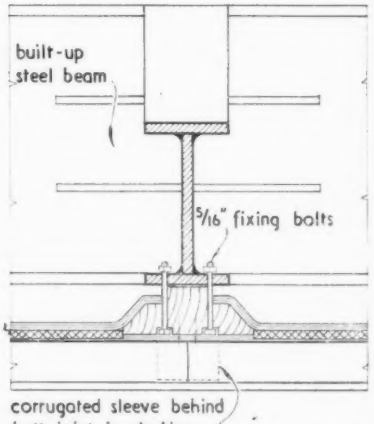




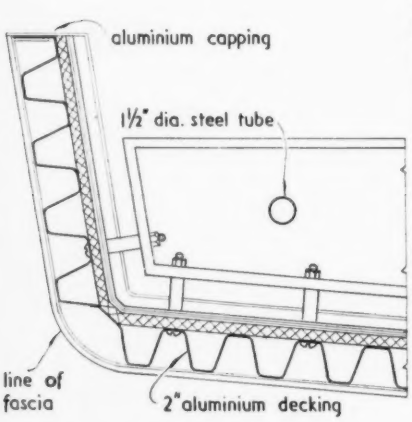
SECTION AT 'A'.
scale: 1½" = 1'-0"

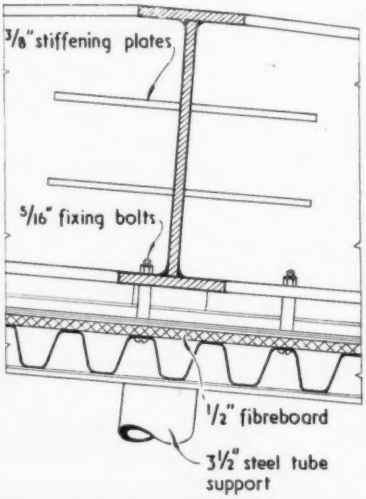


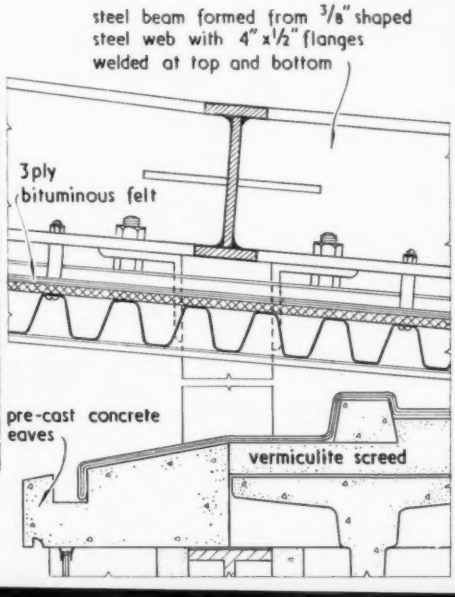
PLAN AND SECTION OF ENTRANCE CANOPY. scale: 3/16" = 1'-0"



SECTION AT 'B'.
scale: 1½" = 1'-0"







SECTION THROUGH FRONT AND REAR OF CANOPY. scale: 1½" = 1'-0"



Hot water storage type	*Location*	*Materials*
Horizontal calorifier for h.w.s.	Calorifier room	Copper

Pipes and jointing types	*Location*	*Materials*
Flanged steam pipes	Throughout	Steel
Compression	Hot and cold water and condensation	Copper
Screwed gas pipes		Galvanised iron

Cold water storage	*Location*	*Materials*	*Capacity*
Tank	Boiler penthouse	12 s.w.g. galvanised iron	250 gallons

SOIL WASTE

Type of system	*Location*	*Materials*
Two-pipe system, foul and surface water	External	Concrete

Drain and rainwater disposal types	*Location*	*Materials*	*Method and comments*
Spun concrete with cornelius joints	External	Concrete	Cornelius joints to allow for ground movement

FIRE

Structural precautions	*Grade of protection*	*Apparatus, sprinklers, etc.*
Sprinkler system	Grade 1	Sprinkler on 6-in. main with emergency pressure tank of 6,000 gallons

Planning precautions, access for fighting

Access door to sprinkler main valve. Water operates fire bell

COLOUR

Paint types	*Where used*	*Colour treatments*
Heat-resisting gloss	Pipes, boiler, etc.	Service colours used on all pipework for clarity in maintenance. Bright colours on steel work. Light grey walls at working level. Bright panels on access doors to ancillaries and on other doorways
Oil gloss	Woodwork	
Emulsion	Brickwork, hardboard and plaster	

TIME SCHEDULE

Drawings	*Contract signed*	*Work commenced*	*Work completed*	*Type of contract*
May, 1953	September, 1953	September, 1953	September, 1954	Bovis Cost Plus Contract

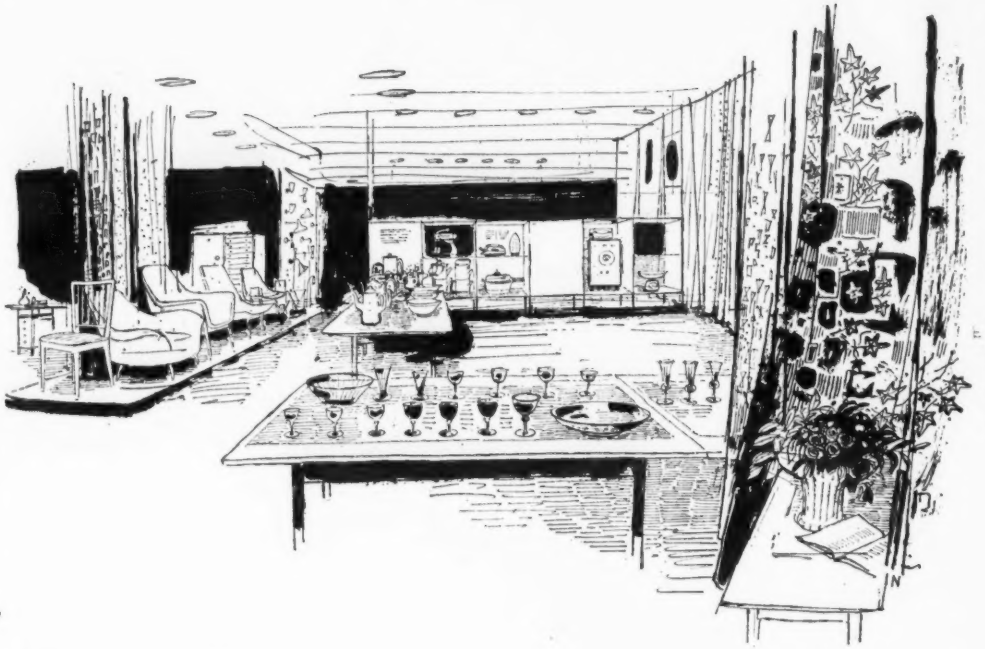
COST ANALYSIS

The client decided that the factory should not be put out to tender, and that Bovis Ltd. should be appointed contractors, using the Bovis special form of contract. A complete cost analysis cannot therefore be obtained

Element	*Cost per sq. ft.* s.	d.
Preliminaries and insurance	4	3½
Steelwork frame	5	8
Roof	7	0½
Roof lights		4½
Windows		4½
Wall finishes, plastering		4½
Plumbing and sanitary fittings		9½
Electric installation	4	7½
Heating, including hot and cold water supply	5	10½
Ventilation	4	1
Drainage	1	5½
Glazing	2	0½
Decoration	1	7½
Paved areas, including roads	1	9

Element	*Cost per sq. ft.* s.	d.
Special thermal insulation		7
Increases on labour and materials		8
Special requirement of N.C.B.	2	6½
Sprinkler installation	2	0½
Earthworks	1	3½
Gates, boundary walls, fencing		5½
Aluminium cladding		3
General builders' work, including ironmongery	9	5½
RC concrete, in situ grano topped floor, including 6-in. hardcore	3	1½
Contractor's fee	5	0½
Block chosen for analysis	78,075 sq.ft	
Estimated cost	£268,754	
Actual cost	£257,160	
Cost per sq. ft.	£3 5s. 10½d.	





NEW DESIGN CENTRE FOR COID

Left: an impression by Ian Baker of the exterior of the Design Centre to be opened by the COID, at 28, The Haymarket, in the spring of 1956. The facade will be encased in a black metal frame and will have yellow panels between mezzanine and ground floor windows. The Centre, which will occupy part of a new building designed by E. Stone, Toms and Partners, will stage a permanent exhibition where buyers may see well-designed durable goods in current production by British industry. About 8,000 sq. ft. of floor area will be available for this purpose, and the COID hope to supplement the permanent exhibition with a series of smaller specialized displays. All goods on view will be selected from "Design Review," the COID's record of well-designed goods in current production. The architects for the street frontage are Ward and Austin. Above: Roger Nicholson's impression of part of the interior of the Design Centre, for which he and his brother, Robert, are to design the exhibition space display fittings. The ceiling will be covered with a modular grid, to give flexibility of lighting and to provide support for suspended display fittings. *See also page 347.*

TECHNICAL SECTION

Whether or not we approve of the Fire Offices' Committee, in so far as it is a body which determines the insurance rates and conditions that the chief insurance companies will adhere to, we cannot take exception to its work as a body interested in reducing the number of fires. The function of the Fire Offices' Committee is to watch the causes of fires and to draft ever more stringent codes of good fire protection practice which building users must follow if the insurance companies are to accept their risk. The Fire Offices' Committee, working through the voluntary body, the Fire Protection Association, has just issued two new publications.* The first, which deals with sprinkler systems, is occasioned by a number of big fires which have broken out recently where sprinkler systems were ineffective. The chief moral of this bulletin is that no spaces in the building (not even roof voids) must be left uncovered by sprinklers; though, for the architect, a point to notice is that the Fire Offices' Committee lays down rules for installation. The second publication is a booklet on the conversion of buildings. The chief preoccupation here is the installation of stoves and furnaces in buildings which were not designed for them, the object lesson this time being the disastrous fire in the Dellwood Nursing Home of a year or so ago, when thirteen babies were killed. The suggested code of good practice goes beyond the regulations in several respects and, insurance rates apart, the conscientious architect should make a point of following it.

* Copies of both publications may be obtained free from the Secretary, Fire Protection Association, 15 Queen St., E.C.4

fittings. See also page 347.

This week's special article

18 CONSTRUCTION: THEORY
tests on composite plank flooring

The number preceding the week's special article or survey indicates the appropriate subject heading of the Information Centre to which the article or survey belongs. The complete list of these headings is printed from time-to-time. To each survey is appended a list of recently-published and relevant Information Centre items. Further and earlier information can be found by referring to the index published free each year.

Though the practical advantages of plank floors are considerable, designers have hesitated to make full use of them owing to uncertainty about how they act under load. This week J. M. Beskine, B.Sc., describes some tests recently carried out by Concrete Ltd. on their "Bison" pre-stressed plank floors.

The tests described in this article are of two kinds: first is a field test carried out on a Bison floor installed at one of the LCC's flats at Leyton Square, Camberwell, and in the presence of the LCC's technical staff, the object of which was to check the accuracy of our design methods; second is a series of laboratory tests carried out by Concrete Ltd. in their own laboratories to discover to what extent the efficacy of the planks was impaired by various forms of inferior workmanship.

THE LEYTON SQUARE TEST

In the field test at Leyton Square a stretch of floor was chosen 3 ft. wide and 12 ft. 10½ in. clear span, the slab being built into the brickwork to a depth of 4½ in. at both ends. The floor was built of 10 in. wide and 2 in. deep pre-stressed concrete

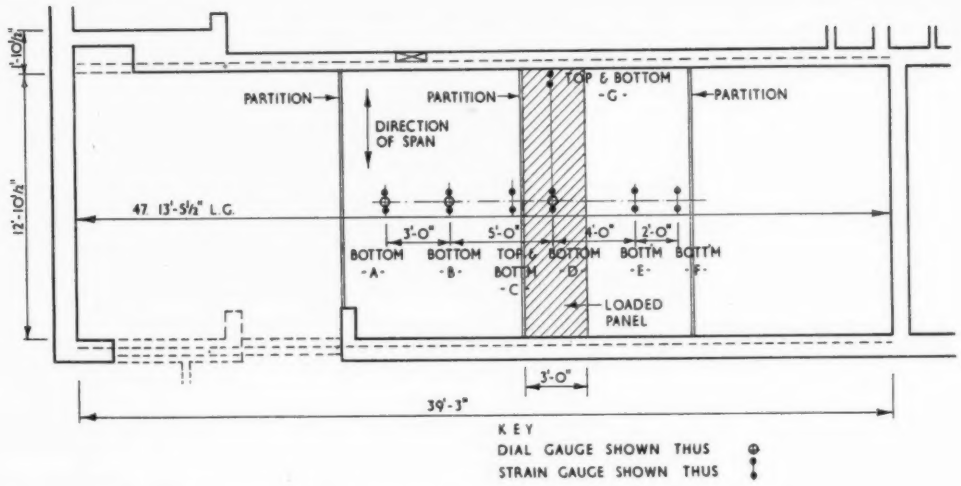


Fig. 1. Plan of the test floor showing position of dial and strain gauges.

planks laid side by side to form a continuous soffit and topped with 2½ in. of vibrated 1 : 1½ : 3 concrete.

Partition walls had already been built on top of the test panel of flooring, and elsewhere on the same floor, as indicated in Fig. 1. However, there were no partition walls below. A test load was uniformly distributed over the test panel, and from an initial loading of 40 lb. per sq. ft. was increased by increments of 40 lb. per sq. ft. to a maximum of 280 lb. per sq. ft. The total load on the panel at any test load would have to include an allowance for the weight of the partition wall. Deflection gauges and strain gauges were positioned at mid-span on the test panel, and at mid-span on the floor at points to the left and the right of the test panel. Strain gauges were also located near one end of the test panel. Two of the strain gauges were posisioned at the top of the flooring (C top, and G top, Fig. 1). All other gauges were positioned at the bottom of the flooring.

Details of the flooring tested are given in Table 1. The deflection gauge readings in inches are given in Table 2. From this data the deflections at test loads of 62 lb. per sq. ft. and at 282 lb. per sq. ft. were determined by interpolation and extrapolation. The design load equalled 62 lb. per sq. ft. plus weight of partitions, which were included in the test.

The deflection at mid-span directly under the test load was 0·005 in. at 62 lb. per sq. ft. and 0·057 in. at 282 lb. per sq. in. Corresponding proportion of span figures are 1/32,000 and 1/2,800. The ratio of deflection to span with this composite plank floor according to these results, is remarkably low. After removal of the test load the recovery at mid-span under the load was within 7 per cent. of the maximum deflection. The maximum test load was large enough to enable one to conclude that the composite plank floor has a good recovery after removal of superimposed loads.

TABLE 1: DETAILS OF FLOOR SLAB TESTED

Moment of Inertia per Strip	74·4 in.⁴
Distance of Neutral Axis from Top	2·20 in.
Distance of Neutral Axis from Bottom	2·30 in.
Section Modulus (Bottom)	32·4 in.³
Effective Span	13·2 ft.
Design Super Load	40 lb. per sq. ft.
Allowance for Finishes	22 lb. per sq. ft.
Total Design Load (excluding partitions)	62 lb. per sq. ft.

TABLE 2. DEFLECTION GAUGE ACTUAL READINGS OBSERVED IN INCHES

Test Load, lb.: per sq. ft:.	Zero	40	80	120	160	200	240	280	Zero
Gauge Deflection (inches):									
A	0·000	0·000	0·000	0·001	0·002	0·002	0·005	0·006	0·001
B	0·000	0·000	0·002	0·004	0·010	0·010	0·015	0·020	0·000
D	0·000	0·002	0·007	0·015	0·023	0·030	0·040	0·056	0·004

LATERAL DISTRIBUTION OF LOAD

One purpose of the tests at Block 4 was to study deflection, another was to investigate the lateral distribution of load. The stresses at positions A to G were determined from the strain gauge readings, and they show that there is some lateral distribution of the load. This lateral distribution appears to be spread over adjacent parts of the floor to the panel tested, for about 8 ft. on either side. If the load distribution over the test panel and the adjacent flooring is assumed to be triangular in form some interesting deductions may be made. Thus, at 282 lb. per sq. ft. test load, the total load is almost 11,200 lb. and it can be shown that the maximum intensity of loading (approximately along the transverse centre line through the test panel) is 1,120 lb. per ft. width, *i.e.*, say, 84 lb. per sq. ft., or a little over twice the design super load. Actually, it can be shown that approximately 30 per cent. of the total load is carried by the 3-ft. strip, and 70 per cent. is carried by the adjacent flooring, the total load being spread over 20 ft. of flooring.

Although further tests would be necessary before any conclusions could be drawn regarding the amount of lateral load distribution which can be permitted, the data already obtained must certainly indicate that significant lateral distribution of load does occur with a composite plank floor.

A further conclusion which may be drawn from a study of the data obtained during these tests (Block 4, Friary Estate) is that the bending moment on the plank flooring is relieved by end fixity, which is, of course, what one would expect. As a point of interest it may be mentioned that from comparisons between the strain gauge readings for positions C, D and G it was deduced that the degree of fixity is such as to reduce the simply supported stresses at mid-span by about 40 per cent. It should also be noted that there was agreement between the deflection and strain gauge readings. The deflection was calculated from the strain, and after allowing for end fixity, was found to be in close agreement with the observed value.

THE SIGNIFICANCE OF LABORATORY TESTS

Architects and surveyors will be interested in a series of laboratory tests carried out by Concrete Ltd., at their Hounslow works during the past five years. Their objectives were: (*a*) to investigate the degree to which inferior workmanship in the factory or on

BISON IN BELFAST



Annadale Flats, Belfast
Architect: J. W. Adamson, A.R.I.B.A., Dip.T.P., A.M.T.P.I., Housing Architect, Belfast
Contractors: J. M. Reilly Limited

20,000 yards BISON units

were supplied by our Belfast concessionaires
MACRETE LIMITED



BISON

floors, beams and precast frame structures

MADE BY THE LARGEST MANUFACTURERS OF CONSTRUCTIONAL PRESTRESSED CONCRETE IN THE WORLD

CONCRETE LIMITED

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LEEDS Stourton, Leeds 10. *Leeds 75421*
LICHFIELD Dovehouse Fields, Lichfield, Staffs. *Lichfield 2404*
FALKIRK Etna Road, Falkirk. *Falkirk 1585*
EDINBURGH Sighthill Industrial Estate, Edinburgh. *Craiglockhart 1729*

Exhibitors at the London & Glasgow Building Centres

CON/43



Flawless Flooring



IF you are faced with the problem of deciding on a suitable floor covering for an important industrial client, your problem may be solved by De La Rue 'Plasvic' Floor Tiles. Their hard-wearing qualities and relatively low cost will appeal to the economist, their colours to the artist and their acid-resistance to the chemist. 'Plasvic' Floor Tiles have been found to meet most of the needs of industrial and commercial users. These (to mention only a few) include hospitals, laboratories, factories, stores, shops, cinemas, schools and power stations.

These are the advantages...

LONGER LIFE. 'Plasvic' Tiles retain their hard-wearing decorative quality indefinitely without danger of cracking.

GREATER RESILIENCE. 'Plasvic' Tiles are very flexible and will not chip or craze even if subjected to heavy blows. The surface recovers after varying weight loads.

MORE HYGIENIC. 'Plasvic' Tiles are manufactured with such precision that dirt traps caused by gaps between the tiles are eliminated. Tiles are proof against rot and termites.

FIRE RESISTANCE. 'Plasvic' Tiles do not support combustion and are self-extinguishing.

STAIN RESISTANCE. 'Plasvic' Tiles are unaffected by water, oils, fats, etc., and are proof against common acids and alkalis.

Series F11. (Motor Showroom) combines these features with additional resistance against staining from motor car tyres.

EASY, INEXPENSIVE MAINTENANCE. 'Plasvic' Tiles are comfortable and quiet underfoot, yet they are tough and long-wearing and require the minimum of maintenance. They can be cleaned with a wet or dry mop and will take a wax floor polish if desired.

EASIER INSTALLATION. 'Plasvic' Tiles can be laid on most types of sub-floors. In the case of sub-floors laid direct to earth, an adequate damp course must be provided. 'Plasvic' Tiles, being extremely flexible, can be easily radiused to form coves and can be cut into motifs and patterns.

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De La Rue Floors & Furnishings Limited, Dept. F.T.I.
Imperial House, 84-86 Regent Street, W.1. Tel: REGent 2901

site during laying, might influence performance; (*b*) to investigate the possibility of bond slip; (*c*) to prove the effectiveness of the dovetail key employed between the topping and adjacent planks; (*d*) to prove the design method used for trimming large holes in composite plank floors; and (*e*) to study what occurs under prolonged overloads.

A lengthy report of the tests has been published. Some of the conclusions arrived at are summarized here. Some of the tests were carried out on floors which had been purposely constructed with materials and workmanship inferior to those specified. In one case the tops of the planks were floated off smooth and paper was laid on before pouring *in situ* concrete, which was of good quality. After three months the ratio between the applied bending moment at failure and the design resistance moment was at least 3:1. In a further experiment, with similar isolation of the topping concrete, bays having spans up to 15 ft. were erected without props, and in other cases the props were removed immediately after topping. The ratio between the applied bending moment at failure and the design resistance moment was not less than 2·4:1. When tests were carried out on floors having a cube strength of only 2,000 lb. per sq. in. the ratio between the applied moment at failure and the design resistance moment was 2:1.

One test load was left in position for 12 months. In this case three complete floor panels were left loaded with 1½ times design load. There was no sign of cracking or excessive deflection and the recovery after removal of the load was virtually complete. Bison plank floors have, up to now, been laid by the manufacturers, Concrete Ltd. It is expected that in future building contractors themselves may carry out all the necessary work on site. There would probably be prior approval of such building contractors: they would have to possess suitable lifting tackle, if necessary weigh batching plant as well; their standards of workmanship would have to be high and consistent. Current job studies have shown that one gang of men can lay as much as 500 sq. yd. of planks per day, and that by using a tower crane the equivalent of 10 sq. yd. of planks can be raised per lift. Generally, the price of a composite plank floor should be appreciably lower than that of *in situ* floor. However, for small contractors, because of the need for the necessary mixing plant, a plank floor may not be economical. Where a wholly pre-cast floor is particularly suitable, the apparent cost of a plank floor may be slightly higher; but after allowing for the saving in screed and floor thickness, the true cost of pre-cast and composite plank floors will be found to be about the same.

INFORMATION CENTRE

A digest of current information prepared by independent specialists; printed so that readers may cut out items for filing and paste them up in classified order.

8.47 surveying: specification

PRACTICAL SURVEYING

Concise Practical Surveying. W. G. Curtin, A.M.I.STRUCT.E., and R. F. Lane, A.R.I.C.S. (English Universities Press Ltd. 15s.)

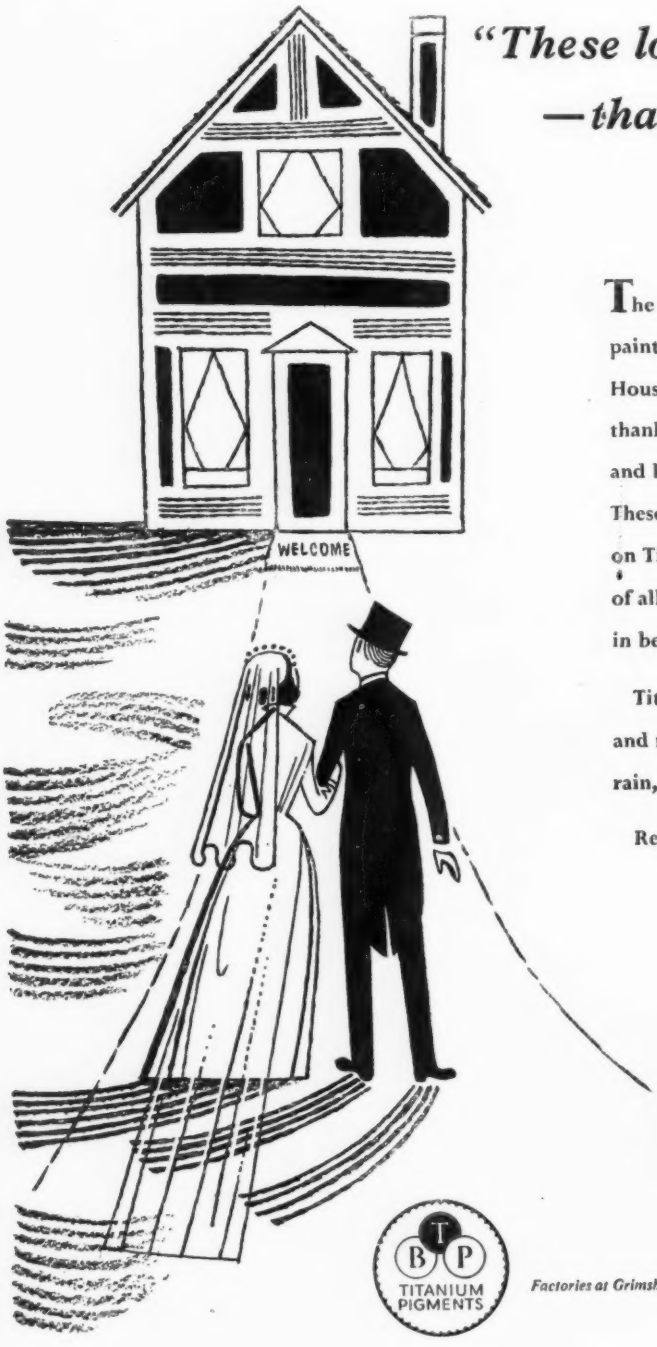
A book of some 170 pages on the techniques of surveying which takes the reader up to the standard of the National Certificates and Diplomas and the examination requirements of bodies such as the Institution of Structural

(*Continued on page* 370)

Fig. 2. General view of plank flooring during laying of screed.







"These lovely pastel shades —thanks to Titanium Oxide."

The modern trend towards bright and colourful paints in the home is now spreading to the outside. Houses are looking brighter — gayer — individual — thanks to modern paints which combine colour and brightness with durability and high gloss. These paints depend for their high quality on Titanium Oxide, the brightest and whitest of all white pigments, and the basic ingredient in better paints.

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The book covers the usual range of subjects, from chain surveying to tachometry and plane table surveying, but the emphasis is on the practical side of surveying and there are separate chapters on the application of levelling, contouring, the planning of road and rail services and the fixing of site levels, etc., the computation of areas and volumes, curve ranging, and even the siting and measurement of buildings.

Both of the authors are experienced lecturers and they have presented their subject matter in a very concise and intelligible manner, with plenty of diagrams and a sound index.

Beginners might even find the book too concise but, as the authors emphasize, no amount of book knowledge is of much use without field work and no doubt the student would expect to supplement his reading with some practical instruction on the ground. For all others who, whilst not being land surveyors by profession, have to preserve a working knowledge of the subject, it should prove a most welcome reminder and easy source of reference.

Care should be taken not to throw away the dust cover, which has a survey depicted on the outside. Readers are encouraged to prepare their own survey from the field notes given inside the cover and to compare the results.

18.171 construction: theory
FOUNDATION DESIGN

Foundation Engineering. Rolt Hammond. (Odhams Press Ltd. 1955. 21s.)

Review of foundation technique of interest to architects and engineers.

Foundation works generally call for more skill than any other section of engineering works, particularly in the construction. Text books on the subject are often disappointing as they present just a few general types and concentrate on the structure of the foundation rather than the soil. Mr. Hammond has avoided this error by giving a complete review of the subject without any reference to the particular design of the material of the foundation structure. This makes his book very pleasing to read and acceptable both to the architect and engineer. Chapters I and II review soil mechanics and site exploration giving an introduction to types of soils, laboratory tests and applications, normal sampling techniques and more recent surveying methods such as geophysical, gravity measurement, seismic refraction and resistivity.

Chapter III gives a fairly representative picture of the many precast and *in situ* piles, screwed piles and sheet piling.

Chapter IV deals with vibration controlled foundations covering the method of measuring the vibrations and the materials and methods used in eliminating them. Some actual examples of big machinery are quoted. The remaining chapters deal with the foundations of houses, buildings generally, bridges and sea works, the former two being of particular interest to architects. Board piles, subsidence and settlement and root action of trees are discussed with reference to actual cases.

The final chapter gives details of various difficult foundation problems which have called for considerable ingenuity on the part of both the engineer and contractor.

19.184 construction: details
TIMBER ROOF CONSTRUCTION

Hidden Bolts Prestress Timber Bents. (Engineering News Record. [USA] July 21, 1955. p. 90.)

Attractive timber bents produced at low cost for California church by prestressing sawn timbers. Tapered beams 10 in. by 6 in. at eaves, 16 in. by 6 in. at crown are held together at peak of their 1 in 3 slope by 1¼ in. bolts approximately 7 ft. long bearing against plates in pockets cut in the top of the beams, thus providing a 25-ft. clear span. The bolts lie horizontally and are just within the lower face of the timber at the crown. They are tensioned by torque wrenches to 16,000 p.s.i. putting the crown into compression. Result is structurally sound bents at about half the cost of glued timber arches, the usual alternative.

20.223 construction: complete structure
REINFORCED CONCRETE CONSTRUCTION

Nervi. (Concrete Quarterly 25. April-June, 1955. pp. 20-28.)

Article describing some of the works of Luigi Nervi, the famous Italian engineer.

Professor Nervi would have lectured to a large gathering of architects and engineers in London earlier this year had an unfortunate illness not overtaken him. This loss is somewhat repaired by a review of his work in Concrete Quarterly which draws references and quotations from his own book Costruire Correttamente. Buildings illustrated include the Florence Stadium, aircraft hangars at Orvieto and Orbetello, Exhibition Hall Turin, Ostia Kursaal and the Sports Palace at Vienna.

23.211 heating and ventilation
OFF-PEAK ELECTRIC FLOOR HEATING

Kirkcaldy 8-Storey All-electric Flats. (Brochure compiled by Burgh of Kirkcaldy in conjunction with the South of Scotland Electricity Board, June, 1955.)

A block of flats with off-peak electric floor and water heating.

The brochure was prepared to mark the opening of an eight-storey block of flats at Kirkcaldy. The heating system installed consists of under-floor electric heating in the living room and the hall of each flat and these operate under thermostatic control; the living room and hall heating can be switched off independently. The living room also has a 2-kW electric radiator which can provide additional warmth required during extremely cold weather and could also be used for intermittent heating during the summer when the floor heating may be switched off. The floor panels are on an "off-peak" circuit and the consumption will be charged at 0.7d. per unit compared with the normal rate of 0.875d. per unit, which will apply to the electric radiator.

An electric storage water heater using off-peak electricity will provide 30 gallons of water at 160 deg. F. for use each morning, and as the electricity supply is restored for a period in the middle of the day, a similar quantity of water will be available for use during the afternoon.

The estimated average weekly costs throughout the year for the flats under normal conditions and usage are:

Service	3 *apt. flat*	2 *apt. flat*
	s. d.	*s. d.*
Hot water	4 9	2 5
Floor heating	6 5	5 3
Extra electric radiator	2 10	2 6
Cooking	1 11	1 5
Lighting, etc.	1 9	1 3
Total	17 8	12 10

It remains to be seen how these estimates compare with consumptions in practice, and also how the tenants view the system. The case for the use of off-peak electricity for water heating is fairly clear, for hot water can be efficiently stored in a well-insulated container until it is required. Heat delivered into a floor slab cannot be so easily matched to heating requirements, and the question therefore is whether the difference between the charges for off-peak and normal electricity is sufficient to offset this characteristic.

23.212 heating: ventilation
ELECTRIC SPACE HEATING

Electric Space Heating. E. M. Ackery. (E.D.A. Annual Conference, April, 1955.)

A survey of available types of electric space heaters; includes data on annual consumptions.

The author first discusses the results of medical research on the optimum conditions for comfort. Few, if any, heating systems provide all these conditions and the author suggests that the most important factors are the air temperature to be achieved and the proportions of radiant and convective heat given by the heating system. The higher the proportion of radiation, the lower the air temperature required for comfort, but design should also take account of individual preferences.

The characteristics of different types of electrical heaters are then discussed. The ordinary electric fire with reflector emits up to 70 per cent. of its heat by radiation, with firebars the radiant output will be 50 per cent. These fires are recommended for casual and short period heating. High temperature panels fixed high up and shining downwards give 65 per cent. radiant heat, and low temperature panels vary from 80 per cent. with ceiling heating to 50 per cent. with embedded wall panels and 25 per cent. with flat panels with an air space between them and the wall. Low temperature non-radiant systems such as tubular heaters have 27 per cent. radiant output; convector heaters are less than 10 per cent. Floor heating is given as 56 per cent. radiant.

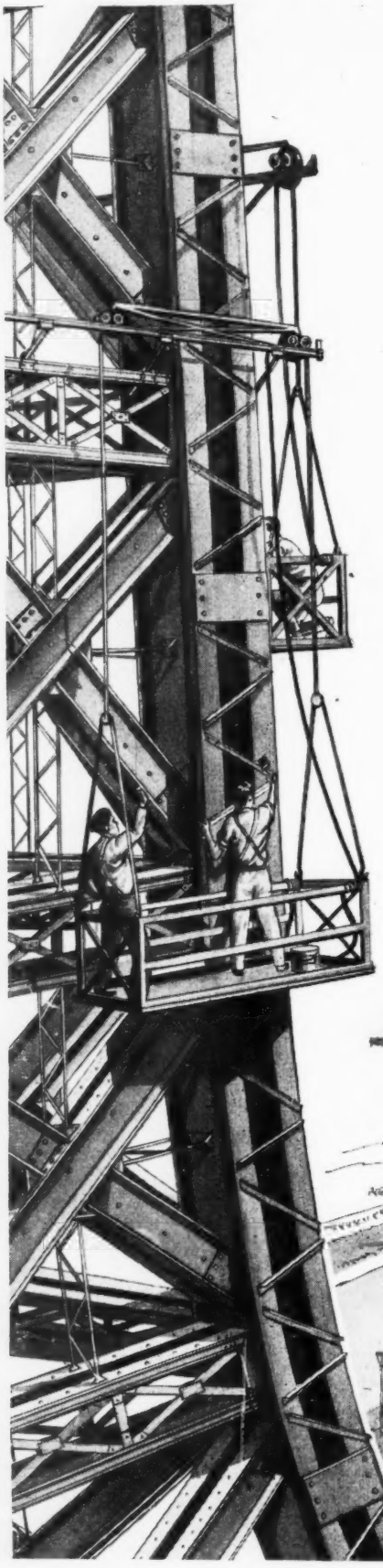
Thermostatic control is most useful with convection systems. With heaters giving highly radiant outputs (when lower air temperatures are possible) the sudden switching off of all radiation is not acceptable; the solution in large installations is to have thermostatic control on part of the system only.

The relationship between the type of building and the heating system is next considered. For light buildings which are used intermittently, an electric heating system which responds quickly is most economical; in heavier buildings there will be less difference in the consumption of such heaters compared with the storage types such as floor heating or concrete block radiators.

Data on the annual consumptions of electricity for different types of heating systems are given for office buildings and schools. To facilitate comparison of consumptions in buildings with different heat losses, the consumptions have been given in KWL/1,000 B.Th.U. heat loss from the building at the design outside temperature of 32 deg. F. The main results are summarized below.

	Annual consumptions KWL/1000 B.Th.U. heat loss
Offices	
(*a*) Blocks larger than 100,000 cu. ft. capacity:	
Electric boiler, thermal storage system, hot water radiators	408
Electric boiler, thermal storage system, mainly panels	652
Direct electrical heating, mainly tubular	376
(*b*) Blocks smaller than 100,000 cu. ft. capacity:	
Electrode boiler, thermal storage system, hot water radiators	596
Direct electrical heating, mainly tubular	449
Day schools	
Electric fires	110
Mainly high temperature panels	180
Mainly tubular heaters	200
Floor heating	510
Electric thermal storage	530

The data for schools show that the consumption with systems using off-peak electricity (floor heating and electric thermal



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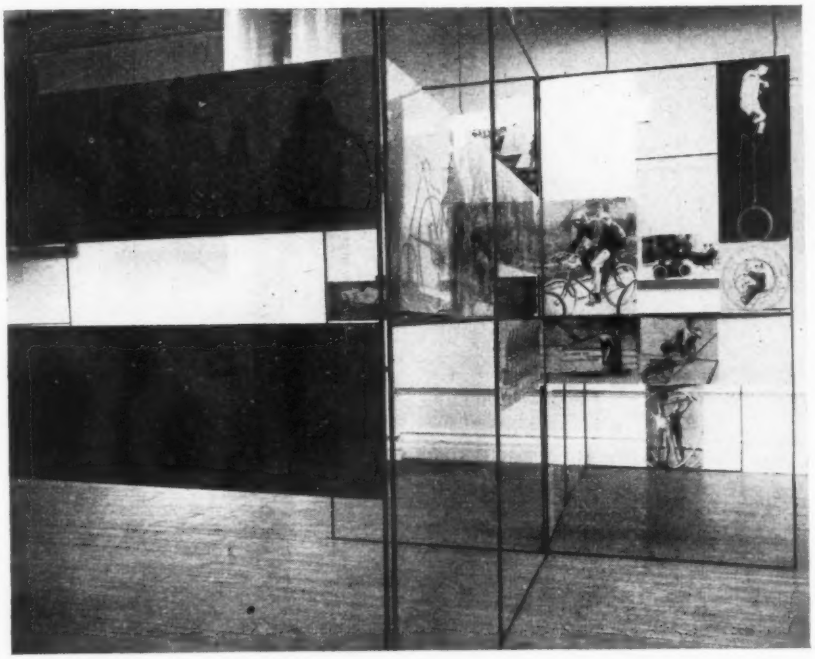
Where a paint film suffers accidental damage any metal thus exposed continues to be protected electrochemically through the sacrificial action of Zinc particles in the vicinity. While protection in this manner naturally decreases as the area affected becomes larger, the spread of corrosion is nevertheless arrested until such time as repainting can be effected. Only Zinc provides this additional safeguard in anti-corrosive paints.

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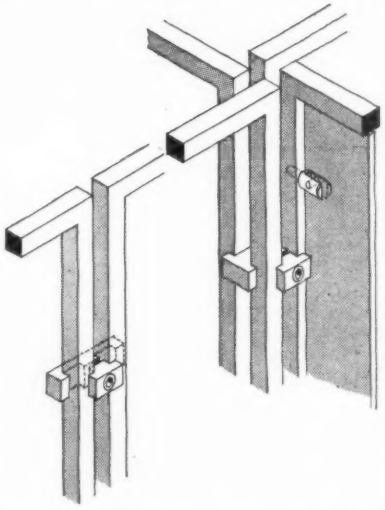
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EXHIBITION DISPLAY STAND AT THE ICA



We illustrate on this page a system of display frames designed by Richard Hamilton for his exhibition Man, Machine and Motion shown recently at the ICA. The frames themselves are built from ¼-in. sq. m.s. bars which are welded at the corners and are coated in black lacquer. The display sheets are two thicknesses of 1/16-in. melamine plastic bonded back to back to avoid the possibility of warping. The sheets are held in the frames by forked panel pegs, the shanks of which fit tightly into holes punched in the frames. The sheets are secured to these pegs by steel pins which, passing through the two sides of the forked head of the pegs, are punched through the intervening sheet. Finally the frames are held together by a repertoire of chromium plated m.s. clamps, cut from ⅝-in. by 5/16-in. bars which are held in place by socket head screws.



storage) is some 2½ times that with direct electric heating; as the off-peak rate is usually about 70 per cent. of the normal rate, the running cost with off-peak systems will be almost twice that with direct electrical systems. The author says that statistics on storage block radiators using off-peak electricity are not yet available, but quotes the Eastern Electricity Board's estimate of 527kWh per 1,000 B.Th.U. of heat loss; this figure may be compared with those given above for offices.

The author is to be congratulated on a most useful paper. Further data of consumptions particularly for storage block radiators, would be most welcome.

CLASSIFICATION FOR INFORMATION CENTRE

1 Sociology. 2 Planning: General. 3 Planning: Regional and National. 4 Planning: Urban and Rural. 5 Planning: Public Utilities. 6 Planning: Social and Recreational. 7 Practice. 8 Surveying, Specification. 9 Design: General. 10 Design: Building Types. 11 Materials: General. 12 Materials: Metal. 13 Materials: Timber. 14 Materials: Concrete. 15 Materials: Applied Finishes, Treatments. 16 Materials: Miscellaneous. 17 Construction: General. 18 Construction: Theory. 19 Construction: Details. 20 Construction: Complete Structures. 21 Construction: Miscellaneous. 22 Sound Insulation-Acoustics. 23 Heating Ventilation. 24 Lighting. 25 Water Supply, Sanitation. 26 Services Equipment: Miscellaneous. 27 Furniture, Fittings, Miscellaneous.

THE INDUSTRY

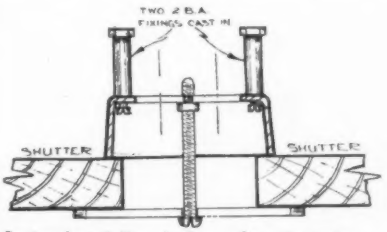
From the Industry Brian Grant reports on a plywood film, a new wiring method, door furniture, two electric water heaters, and a new coal bunker.

FILM

MacMillan & Bloedel Ltd., Canadian manufacturers of Douglas fir plywood, have introduced to this country their film "Sylvaply Today." The film was produced in Canada for publicity purposes and while it shows the many uses for which Douglas fir plywood is suitable, allowance must be made for the very different economic position in this country. It is available on free loan to trade and professional associations and schools, on application to Price and Pierce Ltd., 27, Clements Lane, E.C.4.

WIRING METHODS

Ductube pneumatic tubing, by means of which wiring runs can be cast in concrete, instead of using conduit, has now been on the market for several years. For use with this tubing a series of formers for switch and socket outlets, and for ceiling fittings,



Section through Ductube former for socket outlet.

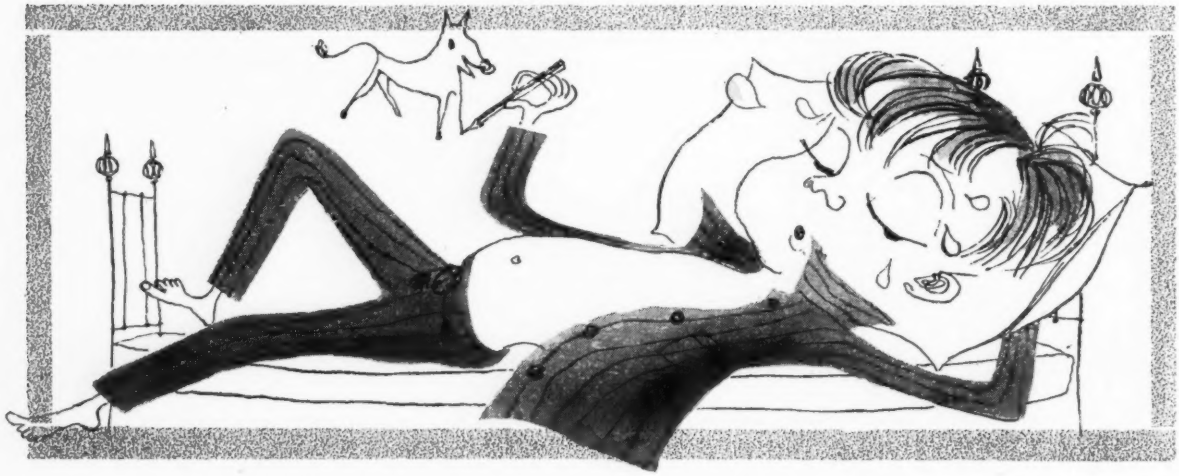
has been developed, and these should show a considerable saving in wiring costs as well as providing a fully insulated system which will not need any metal boxes or other conduit accessories.

The formers are very like the standard BS type box in appearance, but have a taper for easy removal from the concrete. A central screw allows the formers to be anchored through the shuttering to a notched steel strip. A central screw through the back of the box provides a hole into which a bar carrying a pair of adjustable 2 B.A. fixings can be screwed after the former has been removed, thus giving the necessary fixing for switches or sockets. The formers for ceiling fittings is much the same, the only difference being that the back of the former carries two pins which leave holes for Rawlplugs in the concrete or, alternatively, a pair of 2 B.A. bushes can be cast into the concrete. The formers are designed for indefinite re-use, and can be bought outright or hired. It is claimed that with their use it should be possible to form a system of cable ducts at half the labour cost involved

Meet Timothy Percival Augustus

after his bath and about to be embedded. From a steaming hot bathroom he is crossing an Alaskan landing to enter an Arctic bedroom. No wonder he's always catching cold — he lives in a sieve ! Yes, a house that leaks heat in all directions, especially through the roof. The architect who designed it should be made to wash all Tim's hankies . . . What's to do about it? *





Meet Timothy Percival Augustus, drawing rude horses on the wall, because he's too hot to sleep, because there's no roof insulation to keep the house cool, because the architect didn't know, didn't care, or forgot to . . . *

*wrap him in FIBREGLASS TRADE MARK

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in fixing similar conduit installations. (*The Ductube Co. Ltd., 1, Adelaide Street, Strand. London, W.C.2.*)

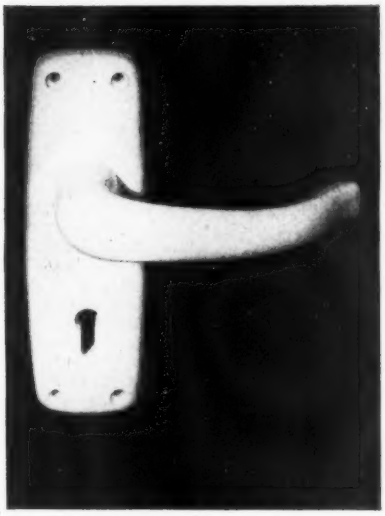
DOOR FURNITURE

Messrs. Lacrinoid have just introduced some new lever door furniture made in plastic. The range includes a lock set as well as a set suitable for mortice latches and the colours available are black, brown and ivory. The end of the lever is curved back towards the door to prevent clothes from catching in it and a floating spindle is used which allows the handle to fit closely on doors of varying thicknesses. (*Lacrinoid Products Ltd., Gidea Park, Essex.*)

TWO ELECTRIC WATER HEATERS

Simplex Electric have just produced a small sink water heater with a capacity of three gallons which is known as the Crusader. This model has a comparatively high electrical loading of 2 kilowatts so that if it should be completely emptied of hot water it will recover fully in not more than 25 minutes. Glass silk is used for the heat insulation and the standing losses are well within the limits specified in B.S.843. A tinned copper container is used for the water and the top is easily detachable, being held in place by a moulded rubber ring. Access to the inside of the container for descaling or any other servicing job is therefore quite easy and can be done without breaking a water joint or indeed without undoing any screws or nuts. Heaters of this kind are not subject to internal water pressure, so that a joint of this kind is perfectly satisfactory in use. (*The Simplex Electric Co. Ltd., Broadwell, Oldbury, Birmingham.*)

For some years it has been comparatively common practice to fit electric storage water heaters underneath the draining board. Most of these heaters have two heating elements, one mounted a short distance from the top of the heater and having a rating of about 500 watts to keep 4 or 5 gallons of water permanently hot for washing-up and other kitchen purposes. The other heating element generally has a rating of about 2½ kilowatts and is placed at the bottom of the tank with a switch to turn it on when the full 20 or 30 gallon capacity is required for a hot bath. Messrs. Hotpoint have now introduced the Twinimerser heater which in effect provides the same service when used in the ordinary hot water cylinder. This consists of two immersion heater elements mounted on one head so that it is interchangeable with standard vertical immersion heaters. One element is loaded at 2 kilowatts and heats only a 10-in. depth of water while the other element has a rating of 3 kilowatts and heats the full depth of water from 21 in. to 36 in. The two heating elements are not in use at the same time but are controlled by a change-over switch mounted on the head of the heater. The switch also operates a link mechanism which sets the thermostat adjustment up slightly, when the 3-kilowatt element is in use. The price is £7 3s. 0d. plus 42s. Purchase Tax. (*The Hotpoint Electric Appliance Co. Ltd., Fletton, Peterborough.*)





Above left, new lever door handle by Lacrinoid. Above right, Crusader sink water heater.

COAL STORAGE

One of the disadvantages of the ordinary coal cellar or storage bin is that large quantities of slack and very small coal invariably collect at the bottom and are nearly always buried and inaccessible when a fresh delivery of coal is made. The Torvic coal bunker overcomes this difficulty to a very large extent, as it contains a grid, rather like the bars of the ordinary grate, through which the dust and very small coal falls into a separate container from which it can be removed and used for banking fires overnight. The larger lumps of coal on top of the grid are accessible in the usual way through a shielded trap door.

The manufacturers produce two different versions of this fitting. One is a coal saver unit for installation in the existing coal cellar, and consists of the grid and its supporting frame plus a pair of sloping wings fitted at each side. The grid stands 12 in. from the floor so that the loss of storage space is therefore comparatively small. Prices of this model vary from about £5 upwards according to size. The other model consists of a complete coal bunker with a storage capacity of approximately 7 cwt. Two versions of this model are produced, one in welded steel sheet, the other in precast concrete. In both models both the filling lid and the door can be locked. The manufacturers produce leaflets giving full technical details for architects and the various designs could of course be modified to give different amounts of storage. After the recent disastrous price increases it seems likely that few people will be able to afford more than 5 cwt. at a time, but any device which allows it to be used more efficiently seems worth investigation. (*V. W. Russell & Sons, Austwick, via Lancaster.*)

Below, Torvic precast concrete coal bunker.



Readers requiring up-to-date information on building products and services may complete and post this form to the Architects' Journal, 9, 11 and 13, Queen Anne's Gate, S.W.1

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15.9.55

Buildings Illustrated

Jeremiah Ambler Ltd. Mill, Peterlee Industrial Estate, Co. Durham, for North Eastern Trading Estates Ltd. (Pages 355-365.) Architects: William Holford & Partner; assistant architects: G. C. Gardiner, K. R. Town, P. A. Nottingham, D. Chakaravati, T. Y. Murray, C. R. W. Wilson. Quantity surveyors: T. Herdman Rae & Partners. Heating and electrical consulting engineer: Cairns & Byles. General contractors: Bovis Ltd. Sub-contractors: excavations and foundations, Dowsett Engineering Construction Co. Ltd.; dampcourses, Ruberoid Co. Ltd., R.I.W. Protective Products Ltd.; facing bricks, Wrays of York Ltd.; structural steel, Redpath Brown Ltd.; roofing and weather proofing, Wm. Briggs & Sons; double glazing, W. H. Heywood & Co. Ltd.; aluminium windows, Mellows Ltd.; central heating, gas fixtures and fittings, Cairns (Newcastle) Ltd.; electrical installation, Troughton & Young Ltd.; sprinkler system and fire alarm bells, Mather & Platt Ltd.; aluminium external cladding, Tentest Ltd.; internal cladding, W. F. Holloway & Bros. Ltd.; folding gates, Bolton Shutter Gates Ltd.; air conditioning installation, Mellor Bromley Ltd.; paints, British Paints Ltd.; artificial stone, Craddock Allison Ltd.; kerbs, Dunwoodie & Co. Ltd.; welded trusses, Hills Ltd.; landscaping, North East Trading Estates Ltd.; roads, Alston Limestone Co. Ltd.; sanitary fittings, Shaw & Knight & Sons (Bishop Auckland); re-inforced concrete chimney, Tileman & Co. Ltd.; joinery and woodwork, Bovis Workshops; boilers, Daniel Adamson Ltd.; stokers and elevating gear, Bennis Combustion Ltd.; quarry tiles, Summers & Co. Ltd.; patent flooring and stairtreads, Rowan & Boden Ltd.; door furniture, Stedall & Co. Ltd., Dryad Metalwork Ltd.; telephones, G.P.O.; roller shutters, Milners Safe Co. Ltd.; plaster, W. E. Pickering; suspended ceilings, Expanded Metal Co. Ltd.; floor and ceiling panel heating, Benhams Ltd.; granolithic pavings, Stuarts Granolithic Co. Ltd.; concrete treatments, Chemical Building Products Ltd.; reinforcement, British Reinforced Concrete Ltd.; Expamet, Twisteel Reinforcement Ltd.; panelling in main hall, Ayrton-Graham Ltd.; dome light and roof lights, Williams & Watson Ltd.; lavatory partitions, Conways Ltd.; cranes and hoists, Herbert Morris Ltd.; insulation, Newells Ltd.; steel decking, Lionweld.

Announcements

PROFESSIONAL

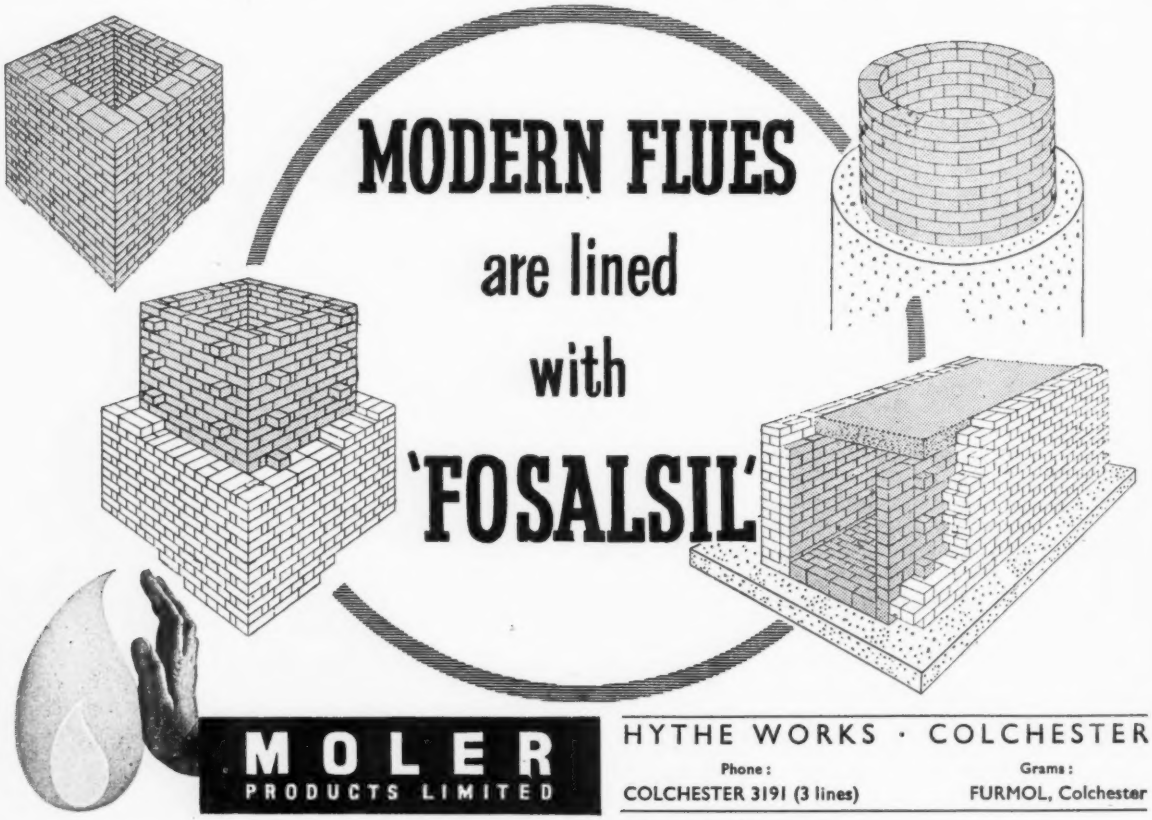
Miss Janet B. Gnospelius, B.ARCH., A.R.I.B.A., has recently started private practice in Church Street, Ambleside, Westmorland, and would be pleased to receive trade literature, etc.

Messrs. Max Lock & Partners, F/A/A.R.I.B.A., M/A.M.T.P.I., have opened an office in Iraq at The Port Planning Office, 527, Pryor Road, Margil, Basrah, where they will be pleased to receive trade catalogues.

Mr. Ian Bradbery, M.S.I.A., has moved to 6, Oak Hill Park, Frognal, N.W.3, telephone number SWIss Cottage 2008.

Mr. J. W. M. Dudding, F.R.I.B.A., A.I.L.A., has taken into partnership his associates Mr. John Middleton, DIP.ARCH., A.R.I.B.A., and Mr. A. B. Grove, DIPL.T.P., A.M.T.P.I., A.I.L.A. The practice will continue as before under the title of John Dudding and Partners at 30, Clarendon Street, Nottingham, telephone numbers 44196 and 46979. A branch office will shortly be opened at Chesterfield, Derbyshire.

Mr. N. W. Hunter, A.R.I.B.A., has moved to 38a, Downshire Hill, N.W.3, until further notice.



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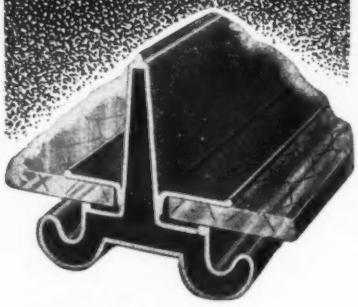
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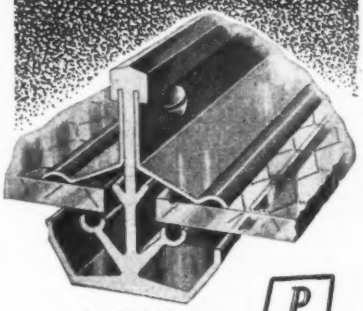
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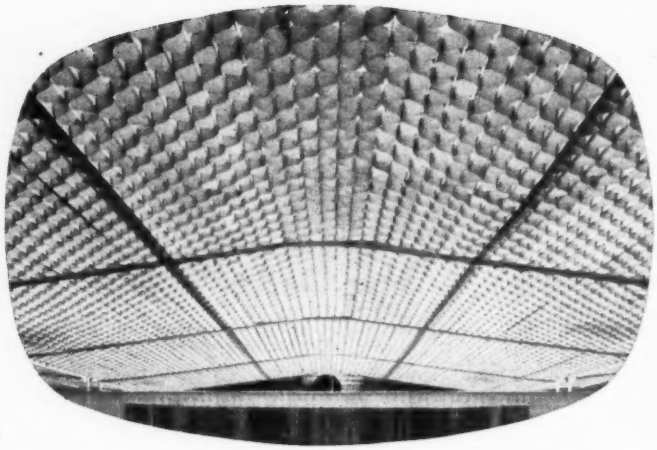
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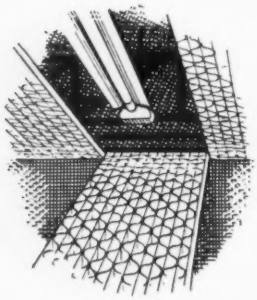
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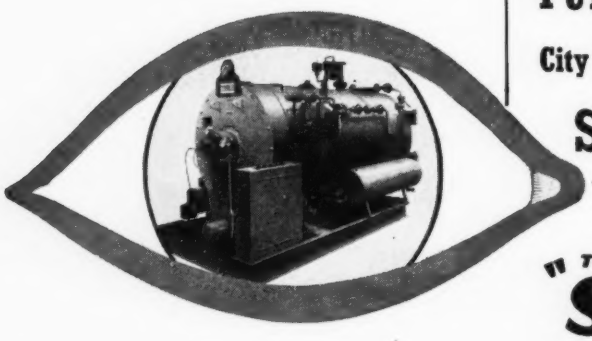
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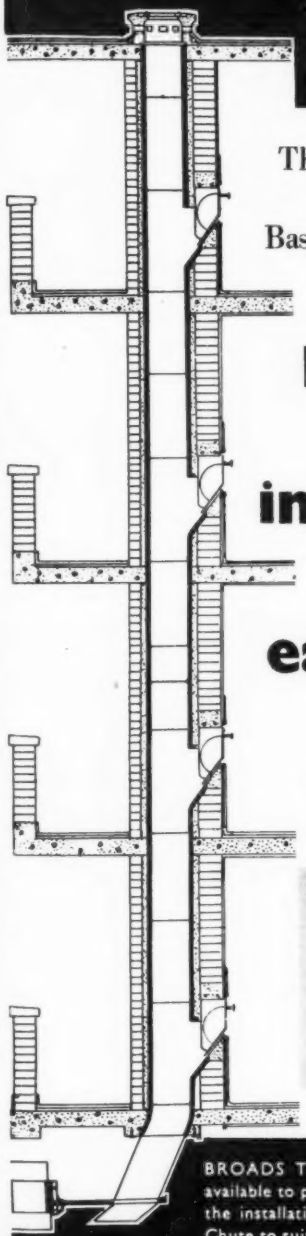
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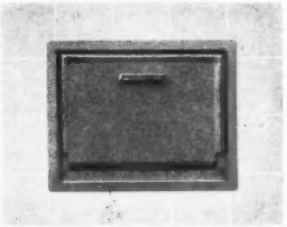
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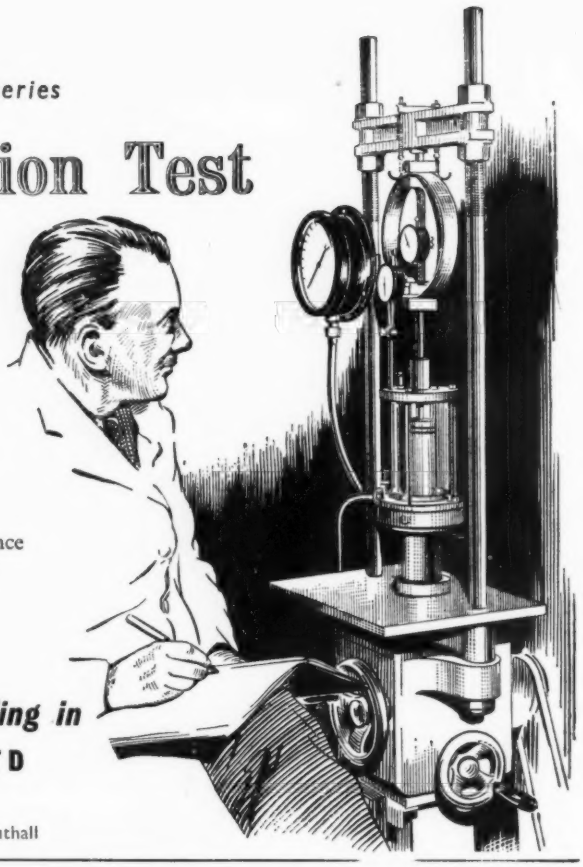
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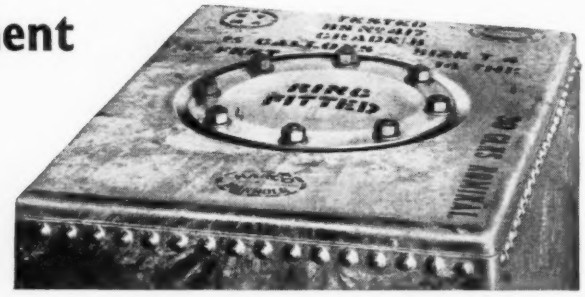
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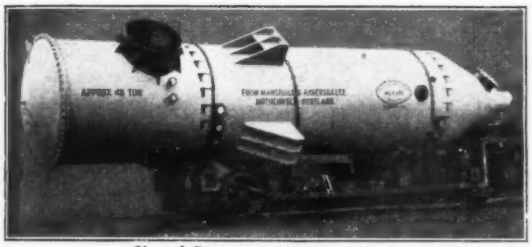
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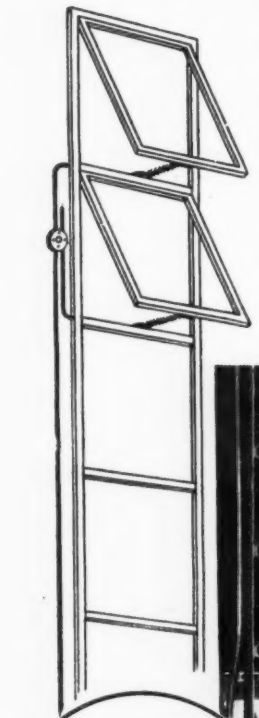
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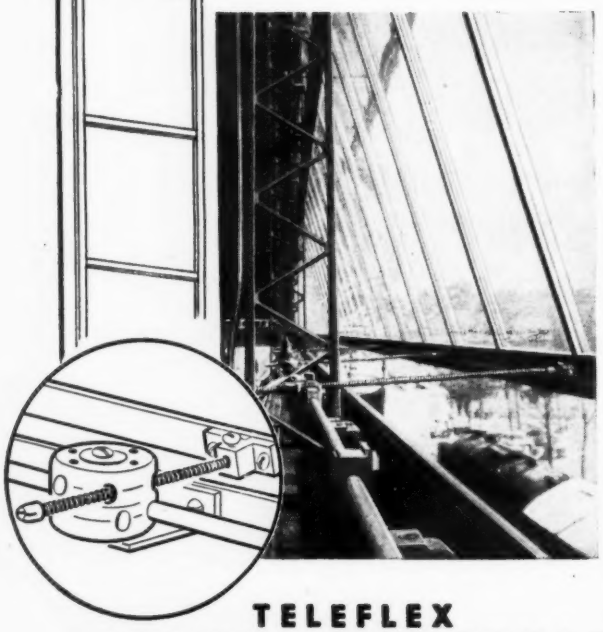
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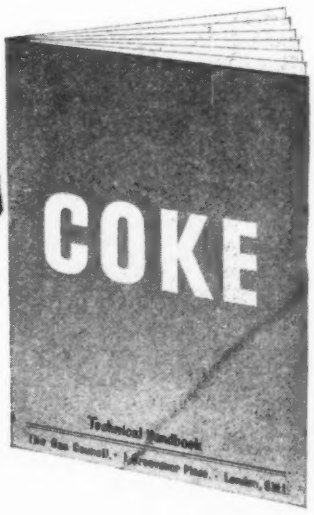
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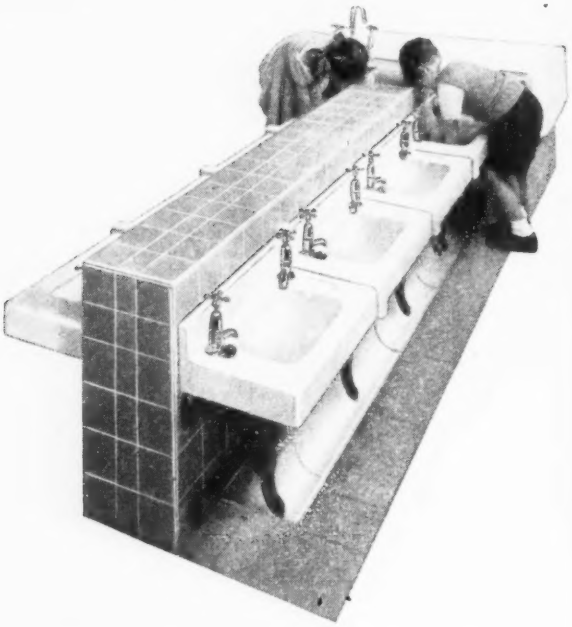
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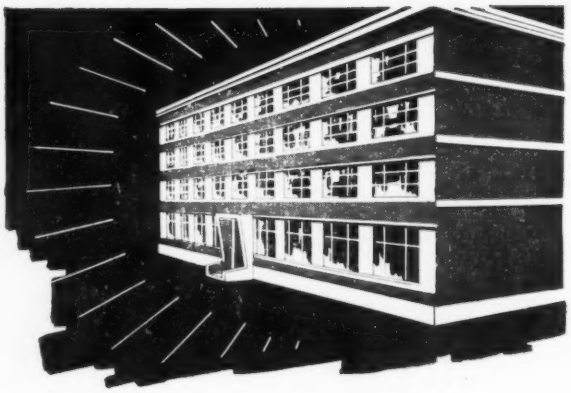
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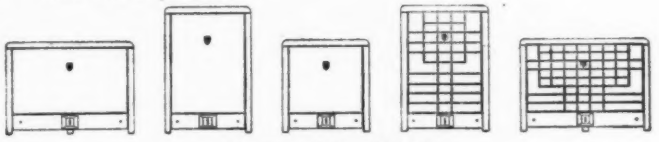
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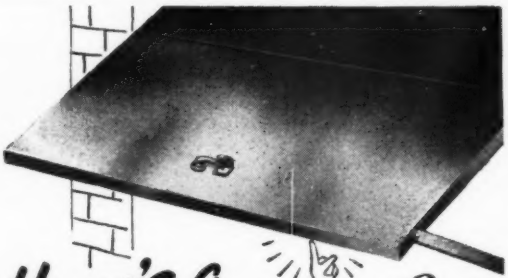
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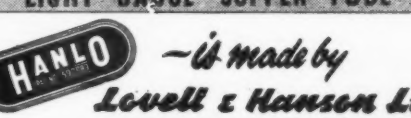
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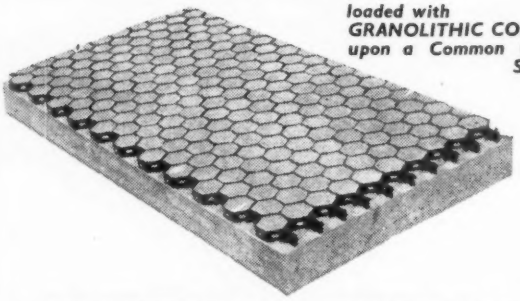
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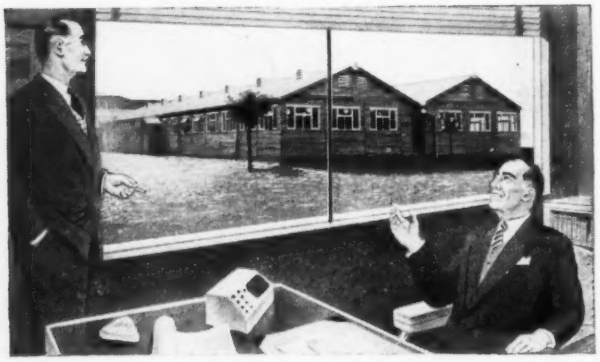
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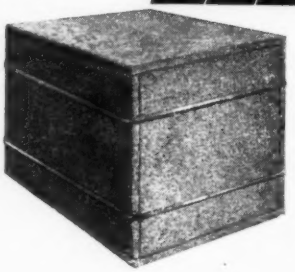


TABLE OF "U" VALUES

Thickness	"U" Figures
1"	0.58
1½"	0.30
2"	0.26

Illustrated is a typical STELLITH lagging unit. The STELLITH slabs are cut to size before leaving the works and are delivered in complete sets. Erection is easily and speedily carried out by simply setting the panels round the cistern and tying them in place with ordinary hoop iron or wire binding. Available for both large and small tanks.

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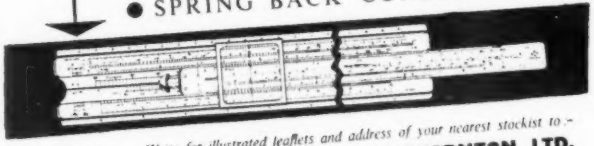
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Reorganisation and Expansion brings opportunity to join staff of well known office where excitement is guaranteed and hard work is appreciated.

* **The Architectural and Planning Department is organised to give opportunities for professional staff to carry full responsibility and show the initiative and imagination for which they have been trained.**

Applications are invited for the posts listed. Appointments above the minimum of the grade may be recommended. Housing accommodation may be made available in approved circumstances. Additional local award to members of approved organisations on salaries up to £750. (£26 p.a. men, £19 10s. p.a. for women.)

Write to Arthur Ling, B.A., A.R.I.B.A., M.T.P.I., City Architect and Planning Officer, Bull Yard, Coventry, for full details of posts and for an application form, which must be returned within 15 days of publication of this advertisement.

ARCHITECTURAL DIVISIONS
(Schools, Central Area, General, Housing and Neighbourhood Development).

Senior Group Architects, Grade "A" £1,058—£1,228 15s. to be responsible for leading a group and for deputising for a Divisional Architect in the supervision of similar groups.

Group Architects, APT. VII, £900—£1,100 to take charge of project groups

Architects, APT. V, £725—£900 to take full charge of a project and see it through from sketch plans to completion.

Architects, Special Grade £650—£775, to work on large projects in a Group or have charge of a smaller project. Candidates must have passed R.I.B.A. Final Examination.

Research Group Architect, APT. VII, £900—£1,100 to lead positive development work, to analyse comparative costs of new methods and materials and assess results of completed schemes; to be responsible for technical library and samples.

Assistant Research Architect, Special Grade, £650—£775.

PLANNING DIVISION.

Senior Group Planning Officer, to lead Development Plan and Research Group and deputise for Principal Planning Officer, Grade 'A', £1,058—£1,228 15s.

Group Planning Officers, APT. VII, £900—£1,100, to lead groups dealing with Central Area Reconstruction, Comprehensive Redevelopment Areas; Development Control.

Planning Officer (Research). APT. V, £750—£900.

Planning Officers. APT. V, £750—£900.

Planning Officers, APT. IV, £675—£825.

Planning Assistants, APT. II, £560—£640.

Senior Landscape Architect, APT. VII, £900—£1,100, to be responsible for landscape design and tree preservation.

Landscape Architect, APT. IV, £675—£825.

Senior Model Maker, APT. III, £600—£725, to take charge of Modelling Section.

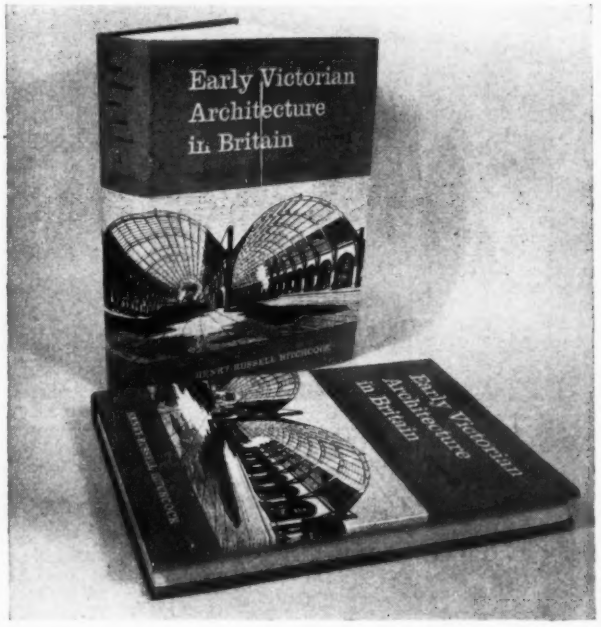
Early Victorian Architecture in Britain

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A MAJOR WORK of scholarship and research of great importance to students of the history of English Architecture. English Architecture from the mid-1830's to the mid-1850's has had a far-reaching influence. Professor Hitchcock interprets his subject broadly: he not only analyses the work of Pugin, Barry, Paxton and the other architects who put up monumental buildings, but gives equal attention to the nearly anonymous fields of commercial and domestic architecture. He discusses the changing trends of English taste during the period and shows that outside influences were of comparatively slight importance.

He shows that what is currently called 'Early Victorian' may in fact be Late Georgian, both in date and characteristically in style. Among the building types described are early railway stations and other iron structures, Anglican and nonconformist churches, public architecture, banks, commercial buildings, country houses and housing in general. A separate volume of illustrations, with plans, contemporary graphic material and many specially taken photographs, shows the full range of early Victorian architecture as it was conceived and as it is today.

Professor Hitchcock has contributed many articles to THE ARCHITECTURAL REVIEW, including 'In Search of a New Monumentality', 'Victorian Monuments of Commerce', 'Early Cast Iron Façades'; and has written several books on architecture, among them being *Modern Architecture* (1929), *The International Style* and *In the Nature of Materials: The Architecture of Frank Lloyd Wright*. He is professor of Art at Smith College, Northampton, U.S.A. Size 10¾ ins. by 8 ins. Volume I, text, 658 pages; Volume II, plates, 232 pages. Price 7 guineas net, the set. Postage 2s. od.



THE ARCHITECTURAL PRESS, 9-13, QUEEN ANNE'S GATE, LONDON SW1

CLASSIFIED ADVERTISEMENTS

Advertisements should be addressed to the Advt. Manager, "The Architects' Journal," 9, 11 and 13, Queen Anne's Gate, Westminster, S.W.1, and should reach there by first post on Friday morning for inclusion in the following Thursday's paper.

Replies to Box Numbers should be addressed care of "The Architects' Journal," at the address given above.

Public and Official Announcements

25s. per inch; each additional line, 2s.

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she or the employment is accepted from the provisions of the Notification of Vacancies Order, 1952.

BOROUGH OF HESTON AND ISLEWORTH.

Applications are invited for the under-mentioned appointments in the Borough Engineer and Surveyor's Department:—

(*a*) SENIOR ARCHITECTURAL ASSISTANT. Salary in accordance with A.P.T., Grade IV (£675×£30—£825), plus London "weighting." Other things being equal, preference will be given to applicants who have passed the examination for Associate R.I.B.A. or hold a University degree or diploma in architecture accepted by that Institute.

The person appointed must have had good experience in architectural design and building work under construction. Duties will include the preparation of sketch designs and working drawings, and the handling of building contracts under construction. Experience in alterations and additions to school buildings, etc., will be considered an advantage.

(*b*) SENIOR TOWN PLANNING ASSISTANT. Salary in accordance with A.P.T., Grade IV (£675×£30—£825), plus London "weighting." Applicants must have obtained the qualifying examination of the Town Planning Institute or an equivalent diploma in town planning recognised by that body. It will be an advantage if applicants hold additional examination qualifications of another professional institute of standing. Applicants must have had considerable experience in the Town and Country Planning Department of a local authority, and experience in the control of staff will be deemed an advantage.

The Council is unable to assist the successful candidates with housing accommodation.

Applications are to be submitted by 3rd October, 1955, on forms to be obtained from and returned to the Borough Engineer and Surveyor, 88, Lampton Road, Hounslow.

D. MATHIESON,
Town Clerk.

Town Hall, Hounslow. 2657

CARLTON URBAN DISTRICT COUNCIL.
APPOINTMENT OF ARCHITECTURAL ASSISTANT.

Applications are invited for the above appointment. Salary in accordance with Special Grade (£650×£25—£775).

Qualifications: Final Examination R.I.B.A. or Registered Architect.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, National Scheme of Conditions of Service, and to satisfactory passing of a medical examination.

Applications, stating age, qualifications, and details of experience, together with names of three referees, to be forwarded to the Engineer and Surveyor by first post on Monday, 19th September, 1955.

Housing accommodation will be made available and removal expenses will be paid by the Council.

A. E. F. WALKER,
Clerk of the Council

Council House, Burton Road, Carlton, Nottingham.

26th August, 1955. 2663

COUNTY BOROUGH OF DERBY.
BOROUGH ARCHITECT'S DEPARTMENT.

(*a*) SENIOR QUANTITY SURVEYOR, Grade IV. Salary £675 to £825 per annum. Qualifications: A.R.I.C.S. (Quantities) or A.I.Q.S., with appropriate experience.

(*b*) JUNIOR QUANTITY SURVEYOR, Grade II. Salary £560 to £640 per annum. Qualifications: R.I.C.S. Intermediate Examination standard or A.I.Q.S. Experienced in abstracting and billing, measuring on site, preparation of final accounts and taking off quantities for small building works.

(*c*) SENIOR ASSISTANT ARCHITECT, Grade IV. Salary £675 to £825 per annum. Qualifications: A.R.I.B.A.

(*d*) TWO JUNIOR ARCHITECTS. Salary General Division (£275 at 20, rising to £400 or £475); A.P.T., I (£500 to £580); or A.P.T., II (£560 to £640), according to qualifications.

Permanent superannuable appointment, subject to one month's notice and to medical examination. National Conditions of Service.

Forms of application obtainable from and to be returned to the Borough Architect, The Council House, Corporation Street, Derby, not later than Monday, 26th September, 1955.

Canvassing disqualifies.

G. H. EMLYN JONES,
Town Clerk.

8th September, 1955. 2785

BRACKNELL DEVELOPMENT CORPORATION.

Applications are invited for the following posts:—

JUNIOR ARCHITECTURAL ASSISTANT, within Grade VIIIb (£330—£630 per annum).

JUNIOR ARCHITECTURAL DRAUGHTSMAN, within Grade IXA. (£170—£470 per annum).

In both cases commencing salary to be according to age and experience. Superannuation schemes. Medical examination. Housing available in due course. Apply by 28th September, 1955, giving age, education and qualifications; experience and appointments held (with dates and salaries), and two referees, to General Manager (J.A.A.), Bracknell Development Corporation, Farley Hall, Bracknell, Berks. 2660

LANCASHIRE COUNTY COUNCIL.

Applications are invited for the following appointments on the permanent staff of the County Architect's Department:—

(*a*) ASSISTANT ARCHITECT, A.P.T., Grade IV (£675—£825), for a programme of Special Schools, Clinics, Occupation Centres and Smallholdings.

(*b*) MEASURING SURVEYORS, A.P.T., Grade III (£600—£725). Successful candidates will be engaged in the measuring of variations and site work for major projects, and the settlement of Contractors' accounts. Applicants should have had experience of similar work in Surveyors' or Building Contractors' offices.

Application forms from the County Architect, P.O. Box 26, County Hall, Preston, to be returned by Monday, 26th September, 1955, quoting Ref. A/AJ. 2626

BOROUGH OF SOUTHGATE.
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.
ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of ONE ARCHITECTURAL ASSISTANT in the Department of the Borough Engineer and Surveyor. The post is permanent and superannuated and is Graded A.P.T., III (£600×£25—£725 p.a.), plus "London weighting." The starting salary will be fixed in accordance with qualifications and experience.

Forms of application may be obtained from the Borough Engineer and Surveyor, and should be returned to the undersigned by not later than 9 a.m. on Monday, 26th September, 1955.

Canvassing, directly or indirectly, will be a disqualification.

GORDON H. TAYLOR,
Town Clerk.

Town Hall, Palmers Green, London, N.13.

August, 1955. 2624

AIR MINISTRY Works Designs Branch require in London and Provinces (with liability for overseas service) ARCHITECTURAL ASSISTANTS experienced in planning/preparation of working drawings and details for permanent and semi-permanent buildings. Salaries up to £850 p.a. (men) and £736 (women). Starting pay based on age, qualifications, and experience. Paid overtime. Posts non-pensionable with long term possibilities. Natural born British subjects only. Write stating age, qualifications, employment details, including type of work done, to any Employment Exchange, quoting Order No. BOROUGH 2303. 2163

BOROUGH OF LEYTON
(In the County of Essex).
LEYTON COMMITTEE FOR EDUCATION.
APPOINTMENT OF ARCHITECTURAL ASSISTANTS.

Applications are invited for the following permanent appointments at salaries in accordance with the National Scales indicated:—

(*a*) ARCHITECTURAL ASSISTANT, A.P.T., Grade III (£630—£755 per annum).

(*b*) JUNIOR ARCHITECTURAL ASSISTANT, A.P.T., Grade I (£530—£610 per annum).

The above salaries are inclusive of London weighting (£30), which is reduced according to scale where age is less than 26. The successful applicants will be employed by the Essex County Council, and will work in the School Architect's Section of the Borough Engineer and Surveyor's Department, Town Hall, Leyton, London, E.10.

Alternate Saturday mornings free of duty and canteen facilities available.

Details and forms of application from the Borough Education Officer, Kirkdale Road, Leytonstone, London, E.11, to whom they should be returned by Friday, 30th September, 1955.

D. J. OSBORNE,
Town Clerk.

Town Hall, Leyton, E.10. 2691

COUNTY BOROUGH OF GREAT YARMOUTH.
SCHOOLS ARCHITECT'S DEPARTMENT.

Applications are invited from Associate Members of the R.I.B.A. to fill the vacancy for a SENIOR ASSISTANT ARCHITECT, within A.P.T., Grade V (£750—£900).

Candidates should have a knowledge of modern school design and construction.

HOUSING ACCOMMODATION will be made available if required.

Applications, stating age, qualifications, experience, and giving details of present and past appointments, together with the names of two referees, should reach the Schools Architect, 22, Euston Road, Great Yarmouth, by 19th September, 1955.

D. G. FARROW,
Chief Education Officer.

22, Euston Road, Great Yarmouth. 2689

BUCKS COUNTY COUNCIL.

Applications are invited for the appointment of a PRINCIPAL ASSISTANT ARCHITECT in the County Architect's Department. Salary J.N.C. Scale "B" (£1,092 10s.—£1,307 10s. p.a.).

The post requires an energetic Architect to run a section, directly responsible to the County Architect.

The appointment is superannuable and subject to medical examination.

A weekly allowance of 25s. and return fare home once every two months may be paid for six months to newly appointed married officers of the Council unable to find accommodation.

Applications, on forms to be obtained from F. B. Pooley, County Architect, County Offices, Aylesbury, must be returned by 30th September, 1955. 2794

BUCKS COUNTY COUNCIL.

Applications are invited for the following Architectural appointments in the County Architect's Department:—

ASSISTANT ARCHITECT, Grade VII (£900—£1,100 p.a.).

ASSISTANT ARCHITECT, Grade VI (£825—£1,000 p.a.).

ASSISTANT ARCHITECT, Grade V (£750—£900 p.a.).

ASSISTANT ARCHITECT, Architect's Special Scale (£650—£775 p.a.).

Applications are also invited for the appointment of an ASSISTANT QUANTITY SURVEYOR, Grade V (£750—£900 p.a.).

The appointments are superannuable, and subject to medical examination.

A weekly allowance of 25s. and return fare home once every two months may be paid for six months to newly appointed married officers of the Council unable to find accommodation.

Applications, on forms to be obtained from F. B. Pooley, County Architect, County Offices, Aylesbury, must be returned by 30th September, 1955. 2793

THE GLASGOW SCHOOL OF ARCHITECTURE.
DEPARTMENT OF TOWN & COUNTRY PLANNING.
POST-GRADUATE COURSE FOR THE DIPLOMA IN TOWN PLANNING.

The Diploma may be taken either as a Full-time Day Course of one session (5 terms) or as a Part-time Course of two sessions. The Part-time Course involves a minimum attendance of two afternoons and three evenings per week. Both courses have been approved by the Town Planning Institute.

Only candidates who have qualified for an "approved" Degree or Diploma in Architecture or who have passed a recognized Final Examination in (*a*) Architecture; (*b*) Engineering or (*c*) Surveying; or who are graduates of a British University with an Honours Degree in Geography or a first or second class General Degree with Geography as a principal subject, are eligible for admission.

The course will commence in the College on Monday, 3rd October, 1955, at 5.30 p.m., when prospective candidates should attend for enrolment.

Further particulars may be obtained from the Secretary, The Royal Technical College, George Street, Glasgow, C.1. 2798

BOROUGH OF LEYTON
(Non-County Borough in the County of Essex: Population 103,200; R.V. £784,110).

Applications are invited for the appointment of:—

GENERAL ARCHITECTURAL ASSISTANT. Established post. Grade A.P.T., III-IV (£600—£825 p.a., plus London weighting allowance according to age, which at 26 is at a maximum of £30). The commencing salary will be fixed at a point in the scale according to the qualifications and experience of the successful applicant.

This appointment is primarily in connection with the proposed re-development schemes in the Borough, and candidates must have had good experience in the design and construction of houses, flats and Municipal buildings.

Alternate Saturday mornings free of duty and canteen facilities available.

Details of the appointment and form of application may be obtained from H. D. Peake, M.Sc.(Eng.), Borough Engineer and Surveyor, Town Hall, Leyton, E.10, to whom they should be returned not later than Wednesday, 5th October, 1955.

D. J. OSBORNE,
Town Clerk.

Town Hall, Leyton, E.10. 2746

LONDON ELECTRICITY BOARD.
ASSISTANT QUANTITY SURVEYOR.

Applications are invited for the above position in the Construction Branch of the Chief Engineer's Department in Central London.

Applicants should be experienced in the preparation of Bills of Quantities in all their stages, measurement of variations and remeasurement of contracts, and the successful candidate will work under the direction of a Chartered Quantity Surveyor.

The post is graded under Schedule "C" of the National Joint Board agreement as Grade 4—£787 10s. per annum, rising to £997 10s. per annum, inclusive of London allowance.

Application forms obtainable from Personnel Officer, 46/7, New Broad Street, London, E.C.2, to be returned completed within 14 days from the publication date of this advertisement. Please enclose addressed envelope and quote Ref. V/2000/A. 2778

CITY AND COUNTY OF BRISTOL.
CITY ARCHITECT'S DEPARTMENT.
Applications invited for undermentioned appointments on staff of City Architect's Department.

ASSISTANT ARCHITECTS:
(*a*) A.P.T., VII (£900—£1,100 p.a.).
(*b*) A.P.T., V (£750—£900 p.a.).
(*c*) A.P.T., III (£600—£725 p.a.), or Special Scale (£650—£775 p.a.).
(*d*) A.P.T., II (£560—£640 p.a.).
QUANTITY SURVEYORS:
(*e*) A.P.T., VII (£900—£1,100 p.a.).
(*f*) A.P.T., III (£600—£725 p.a.), or Special Scale (£650—£775 p.a.).

Starting grade will be appropriate to professional experience and qualifications. Further particulars and application forms obtainable from me. Applicants must state post for which they are applying.
HOUSING ACCOMMODATION AVAILABLE, IF NECESSARY, AT AN ECONOMIC RENT.
Completed application forms to be received by 30th September.

J. NELSON MEREDITH, F.R.I.B.A.,
City Architect.
The Council House, College Green, Bristol, 1.
2750

BURGH OF HAMILTON.
ASSISTANT ARCHITECT.
Applications for the above post in the Burgh Architect's Department are invited from Associates of the Royal Institute of British Architects (or equivalent qualification), with experience in post-war housing and civic building design, etc. The post is superannuable, and the salary A.P.T., VII (£790—£865), with placing according to qualifications and experience. The successful applicant will be given the tenancy of a house if required.
Applications, containing full particulars of age, qualifications and experience, together with the names of three referees, should be lodged with the undersigned not later than 21st September, 1955.
Canvassing, either directly or indirectly, will be a disqualification.

JAMES KELLY,
Town Clerk.
The Town House, Hamilton.
6th September, 1955. 2762

SURREY COUNTY COUNCIL.
Applications invited for following appointments:—
(1) ASSISTANT ARCHITECT, Grade V (£750×£30—£900 p.a., plus London allowance). Should be Associate Member R.I.B.A.
(2) ARCHITECTURAL ASSISTANT, Grade II (£560×£20—£640 p.a., plus L.A.). Must be of good general training, and preference given those who have passed Inter. R.I.B.A.
(3) ARCHITECTURAL ASSISTANT, Grade I (£500×£20—£580 p.a., plus L.A.).
(4) ASSISTANT QUANTITY SURVEYOR, Grade IV (£675×£30—£825 p.a., plus L.A.). Should be Associate Member R.I.C.S.
Full details and present salary, accompanied by copies of three recent testimonials, to County Architect, County Hall, Kingston, as soon as possible. 2670

CORPORATION OF LONDON require for City Planning Office (Civic Design Section) PLANNING ASSISTANTS. (*a*) £599 17s. to £738 9s.; (*b*) £194 3s. (at age 16) to £528 17s. (at age 30). Duties include general draughting work, assistance in preparing three-dimensional layouts and small-scale modelling. Local Authority experience not necessary; preference given to those with sensitive and contemporary approach to design. Applications with experience, age, present salary and references, to City Planning Officer, 55/61, Moorgate, London, E.C.2, within 14 days. 2649

METROPOLITAN BOROUGH OF WANDSWORTH.
ARCHITECTURAL STAFF.
Applications invited for established posts of: (*a*) TWO SENIOR ASSISTANT ARCHITECTS, Grade A.P.T., V (£780—£930 p.a.), and (*b*) ONE ARCHITECTURAL ASSISTANT, Special Classes, Grade III(A) (£680—£805 p.a.).
Applicants for posts (*a*) must be Associates of the R.I.B.A., and have had experience in the design and planning of multi-storey blocks of flats and/or other framed buildings, and in the supervision of their erection. Experience in local authority work is desirable.
Applicants for post (*b*) must have passed Parts I and II of the R.I.B.A. Final or Special Final Examination or their equivalent at one of the recognised schools of architecture, and had at least 5 years' experience, including training.
Application forms obtainable from the Borough Engineer must reach me by 28th September, 1955.

R. H. JERMAN,
Town Clerk.
Municipal Buildings, Wandsworth, S.W.18. 2736

LEEDS REGIONAL HOSPITAL BOARD invites applications for the appointment of QUANTITY SURVEYING ASSISTANT.
Salary scale £480×£20 (7)×£25 (2)—£670 per annum. Commencing salary according to age and experience.
Applicants must have passed the Intermediate Examination of the R.I.C.S. or an examination recognised by the Institution as equivalent.
Applications, giving full particulars, together with the names of two referees, to be forwarded to the Secretary, Park Parade, Harrogate, as soon as possible. 2788

HEREFORDSHIRE COUNTY COUNCIL.
Applications are invited for the following posts:—
(*a*) ONE ASSISTANT ARCHITECT, Grade VII (within salary range £900 to £1,100), A.R.I.B.A., to take charge of section.
(*b*) TWO SENIOR ASSISTANT ARCHITECTS, Grade VI (within salary range £825 to £1,000), A.R.I.B.A.
Superannuated posts, subject to passing medical examination, and one month's notice on either side.
Travel and subsistence allowance for limited period payable to married men in certain cases.
Application forms from County Architect, Bath Street, Hereford, to be submitted by 19th September, 1955. 2693

COUNTY COUNCIL OF ESSEX.
Required on established staff—SENIOR ASSISTANT ARCHITECTS, Grade V, A.P.T.D. Salaries according to qualifications and experience, but not exceeding £900. Candidates must be Members of R.I.B.A.
The appointments offer opportunities for design and supervision on a variety of buildings—colleges, libraries, day and boarding schools, police and fire stations and health buildings—and successful candidates will have much responsibility within the group system.
Application forms from H. Conolly, F.R.I.B.A., County Architect, County Hall, Chelmsford, to be returned with copies of three testimonials by 30th September, 1955.
Canvassing disqualifies. 2790

CITY AND COUNTY OF THE CITY OF EXETER.
Applications are invited for the following appointments on the establishment of the City Architect's Department:—
(*a*) PRINCIPAL ASSISTANT ARCHITECT, taking immediate responsibility for the Housing Section. Salary within A.P.T., Grade V, *i.e.*, £750 to £900 per annum.
(*b*) SENIOR ASSISTANT ARCHITECT. Salary within Special Grade/Grade IV, *i.e.*, £650 to £825 per annum.
Applicants for both posts must be Associate Members of the R.I.B.A. or hold equivalent qualifications, and must have had considerable experience in Municipal housing and other works.
For post (*a*) applicants must be thoroughly experienced in the design of housing layouts, houses and flats, etc., and fully competent to adminster contracts from inception to completion.
The appointments will be subject to one month's notice on either side, and to the provisions of the Local Government Superannuation Acts, 1937-1953.
Successful applicants will be required to pass a medical examination.
Canvassing will disqualify, and applicants must disclose whether, to their knowledge, they are related to any member of the Council or to the holder of any senior office under the Council.
Applications, stating age, qualifications, previous and present appointments and salaries, full details of experience, and the earliest possible date when available, should be sent to H. B. Rowe, F.R.I.B.A., A.M.I.Struct.E., City Architect, Municipal Offices, Exeter, not later than 24th September, 1955.

C. J. NEWMAN,
Town Clerk.
Exeter.
September, 1955. 2729

BOROUGH OF WREXHAM.
Appointment of:—
(*a*) ASSISTANT ARCHITECT. Salary A.P.T., IV (£675 to £825 per annum). A.R.I.B.A. or equivalent.
(*b*) JUNIOR ARCHITECTURAL ASSISTANT. Salary A.P.T., I (£500 to £580 per annum). Inter. A.R.I.B.A. or equivalent.
Applications are invited for the above appointments, candidates to supply details of qualifications, experience, and the names of two referees. Housing accommodation.
Further particulars from the Borough Surveyor, Bodhyfryd, Chester Street, Wrexham. Closing date: 26th September, 1955.

PHILIP J. WALTERS,
Town Clerk.
Guildhall, Wrexham.
7th September, 1955. 2783

COUNTY COUNCIL OF ESSEX.
COUNTY PLANNING DEPARTMENT.
Applications invited for post of DRAUGHTSMAN, Misc. Grades II-IV (£375-£545), at Broomfield. Applicants must be 21 or over, and should be neat and expeditious draughtsmen, able to produce, under supervision, all types of planning maps. Post superannuable. Medical examination. Applications in own handwriting, to County Planning Adviser, Broomfield Place, Broomfield, Chelmsford, as soon as possible. Canvassing forbidden. 2648

URBAN DISTRICT COUNCIL OF BASILDON. Population estimated at 53,000—Area 27,000 Acres.
ENGINEER AND SURVEYOR'S DEPARTMENT.
Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT, A.P.T., III (£500—£725 p.a.). Applicants must have passed Intermediate R.I.B.A. Housing considered.
Full particulars of the appointment and application forms from and returnable to Mr. S. A. Wadsworth, A.M.I.C.E., A.M.I.Mun.E., Council Offices, High Street, Billericay, Essex. Closing date 26th September, 1955. 2787

PADDINGTON BOROUGH COUNCIL require SENIOR ASSISTANT ARCHITECT within A.P.T., Grade V (£780×£30—£930 p.a., £10 p.a. less if under age 26 years). Candidates must be A.R.I.B.A., with experience of local authority work, contemporary design and construction of general Municipal work, including multi-storey flats; supervision of large building contracts and architectural staff; Town Planning experience an advantage.
Applications, stating age, qualifications, present and past appointments, with dates and salaries, details of experience and names and addresses of three referees, should be received by the undersigned by 27th September, 1955 (quoting A.237).

W. H. BENTLEY,
Town Clerk.
Town Hall, Paddington Green, W.2. 2768

COUNTY BOROUGH OF HALIFAX.
APPOINTMENT OF QUANTITY SURVEYOR.
Applications are invited for the above appointment. Salary A.P.T., V/VI (£750—£1,000 p.a.), with point of entry depending on qualifications and experience. HOUSING ACCOMMODATION provided if required. The successful candidate will take charge of the Quantity Surveying section of the Borough Engineer's Dept., and will be responsible for the whole of the quantity surveying work entailed on architectural work, including new schools, housing, etc. Applications, stating age, qualifications, present position, salary and experience, accompanied by copies of three recent testimonials, should be delivered to me by 24th September, 1955.

RICHARD DE Z. HALL,
Town Clerk.
Town Hall, Halifax. 2738

SHIPLEY URBAN DISTRICT COUNCIL.
ARCHITECTURAL ASSISTANTS required, A.P.T., Grade IV (£675—£825), commencing salary £735 p.a. Positions superannuable and subject to the provisions of the National Scheme of Conditions of Service.
Applications, giving age, details of training, qualifications and experience, together with names and addresses of two referees, to the Engineer and Surveyor, Town Hall, Shipley, Yorks., by 10 a.m. on Monday, 26th September, 1955.
HOUSING ACCOMMODATION will be provided if required.

ERNEST PEARS,
Clerk and Solicitor.
Town Hall, Shipley.
6th September, 1955. 2739

ISLE OF ELY COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.
Applications are invited for the following appointments on the staff of the County Architect:—
(1) SECOND ASSISTANT ARCHITECT. Salary £650×£25 to £775 p.a.
(2) THIRD ASSISTANT ARCHITECT. Salary £650×£25 to £775 p.a.
(3) SECOND ASSISTANT QUANTITY SURVEYOR. Salary £600×£25 to £725 p.a.
(4) THREE JUNIOR ARCHITECTURAL ASSISTANTS. Grade Misc. I/II/III. £345—£485 p.a.
The above posts are permanent, subject to the National Joint Council Scheme of Conditions of Service, the Local Government Superannuation Act, and to a medical examination.
Intending applicants are to apply for forms for the posts in which they are interested to the County Architect, County Hall, March, to whom they are to be returned not later than Friday, 30th September, 1955.

R. F. G. THURLOW,
Clerk of the County Council.
2709

COUNTY OF CORNWALL.
APPOINTMENT OF COUNTY ARCHITECT.
Applications are invited from Registered Architects for the whole-time appointment of County Architect, at a salary within the scale of £2,200×£100 (2)×£50—£2,450. Travelling and subsistence allowances will be payable in accordance with the regulations of the Council.
The person appointed will be responsible for all the Council's architectural work, and similar duties on behalf of the Cornwall Combined Police Authority and the Standing Joint Committee.
Applications, together with the names of three persons to whom reference may be made, should be received by me not later than 8th October, 1955.

E. T. VERGER,
Clerk of the County Council.
County Hall, Truro.
2nd September, 1955. 2711

COUNTY BOROUGH OF BOURNEMOUTH.
BOROUGH ARCHITECT'S DEPARTMENT.
Applications are invited for the following appointment:—
ASSISTANT ARCHITECT. Salary grade, Special Scale (£650—£775 p.a.).
Applicants for post must be fully qualified (by examination) Members of the R.I.B.A., have experience of architectural works required by Local Authorities, and be conversant with the Education Building 1944 Act.
Successful candidates will be appointed at present salary if within the incremental scale. Application forms and further particulars from Borough Architect, Town Hall, Bournemouth. Completed applications, with copies of three recent testimonials, must reach the undersigned by 10 a.m. 1st October, 1955.

A. LINDSAY CLEGG, *Town Clerk.*
2757

CWMBRAN DEVELOPMENT CORPORATION.
CLERK OF WORKS.

Applications are invited for the above superannuable post in the Chief Architect's Department to supervise the erection of permanent houses and other buildings; including setting out, levelling, measuring and keeping records.

Commencing salary will be £565 on the scale £565×£25 to £665 per annum.

Housing accommodation will be made available in suitable cases or otherwise lodging expenses in accordance with the Corporation's scale will be allowed for a limited period to married men.

Applications, which should state age, experience, present and former employment (with applicable salaries), together with the names and addresses of two referees, should reach the undersigned by not later than 26th September, 1955.

J. C. P. WEST, A.R.I.B.A., M.T.P.I.,
Chief Architect.
Victoria Street, Cwmbran, Monmouthshire. 2710

CITY AND COUNTY OF KINGSTON UPON HULL, City Architect's Department. Applications are invited for **ASSISTANT ARCHITECT, Grade IV** (£675—£825 per annum). Candidates should preferably be A.R.I.B.A., with experience of modern school design and construction.

Housing accommodation will be provided for successful married candidate.

Forms of application may be obtained from the undersigned, and should be returned completed not later than 30th September, 1955.

A. RANKINE,
City Architect.
Guildhall, Kingston upon Hull. 2753

STAFFORDSHIRE COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited for **ARCHITECTURAL STAFF** at commencing salaries within the ranges:—

(*a*) £675—£825 (Grades IV-V or VI), and
(*b*) £500—£560 (Grades I or II).

Applicants under (*a*) should be Associate Members of the R.I.B.A.

Applications, together with copies of three recent testimonials, should be forwarded to C. M. Coombs, F.R.I.B.A., County Architect, County Buildings, Stafford, not later than 22nd September, 1955, giving full details of experience and qualifications, and stating age, present salary, and salary required.

T. H. EVANS,
Clerk of the County Council.
County Buildings, Stafford.
2nd September, 1955. 2745

UNIVERSITY OF OXFORD.

Applications are invited for the appointment of **ARCHITECTURAL ASSISTANTS** of Intermediate standard for interesting and varied work in pleasant office. Generous leave. Salary £450. Apply for further particulars, stating age, experience, and training, to the Surveyor to the University, 5 South Parks Road, Oxford. 2698

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.

Vacancies for **ARCHITECTS**, Grade III (up to £945), and **ARCHITECTURAL ASSISTANTS** (up to £783), for widespread construction programme, which includes houses, blocks of flats, schools of all types, and various public and industrial buildings. Application forms and particulars from Architect (AR/EK/A/2), The County Hall, S.E.1. (1189) 2766

CRAWLEY DEVELOPMENT CORPORATION require a **JUNIOR ASSISTANT ARCHITECT**, salary scale £520—£670 p.a., R.I.B.A. Intermediate Examination standard, with architectural experience. Work of more than usual variety and interest in progress. Contributory superannuation. Apply on forms from Chief Architect (Vacancy), Broadfield, Crawley, Sussex, by 3rd October, 1955.

C. A. C. TURNER,
Chief Executive.
2769

COUNTY OF PEMBROKE.
COUNTY PLANNING DEPARTMENT.

Applications are invited for the appointment of a **SENIOR PLANNING ASSISTANT (ARCHITECT)**, at a salary in accordance with A.P. and T., Grade IV, of the National Joint Council's scale, *viz.*, £675 per annum, rising to £825.

(Candidates must be Corporate Members of the Royal Institute of British Architects, and preference will be given to applicants who are Corporate Members of the Town Planning Institute or the Institute of Landscape Architects.) Experience in control of elevations, landscape design, and ability for representing planning ideas practically are required.

Approximately one-third of the County of Pembroke is a National Park, and the appointment is primarily concerned with planning in the Park Area.

The appointment will be subject to (i) the National Scheme of Conditions of Service, (ii) the provisions of the Local Government Superannuation Acts, (iii) the passing of a medical examination, (iv) one month's notice on either side.

Forms of application are obtainable from the undersigned to whom they should be returned not later than 16th October, 1955.

H. LOUIS UNDERWOOD,
Clerk of the County Council.
County Offices, Haverfordwest. 2804

KENT COUNTY COUNCIL require **ASSISTANT ARCHITECTS** at salaries (*a*) £675—£825, and (*b*) £650—£775. Candidates for (*a*) must be Associate Members of the Royal Institute of British Architects and for (*b*) must have passed Parts 1 and 2 of the Final Examination of the Institute. Application forms from the County Architect, Springfield, Maidstone. Closing date 29th September, 1955. 2812

BOROUGH OF ROMFORD.

Applications are invited for the appointment of **ARCHITECTURAL ASSISTANT** in the Borough Engineer and Surveyor's Department, in Grade A.P.T., II, of the National Salary Scales (£560—£640 p.a.). The commencing salary will be fixed according to qualifications and experience.

Particulars and conditions of the appointment are obtainable from the Town Clerk, Town Hall, Romford, to whom completed applications must be forwarded not later than 24th Septmeber, 1955. 2807

COUNTY BOROUGH OF DEWSBURY.
BOROUGH ARCHITECT AND BUILDINGS SURVEYOR'S DEPARTMENT.

Applications are invited for the following appointments in the above Department:—

(*a*) **ARCHITECTURAL ASSISTANT** (Education Section).

(*b*) **TEMPORARY ARCHITECTURAL ASSISTANT** (Housing and General Section).

The salaries will be in accordance with A.P.T. Grade II (£560—£640 per annum), the commencing salary to be fixed within the scope of this grade for each post. Appointment (*a*) is permanent and appointment (*b*) is temporary for a period of approximately eighteen months.

The appointments will be subject to one month's notice on either side and to the provisions of the Local Government Superannuation Acts. The successful candidates will be required to pass a medical examination.

Applications stating age, education, qualifications, full particulars of training and experience, together with copies of two recent testimonials, should be sent to the undersigned not later than Monday, the 3rd October, 1955, in envelopes endorsed "Appointment of (*a*) Architectural Assistant (or (*b*) Temporary Architectural Assistant)".

A. NORMAN JAMES,
Town Clerk.
Town Hall,
Dewsbury.
7th September, 1955. 2811

BOROUGH OF ENFIELD.
BOROUGH ENGINEER'S DEPARTMENT.

Applications are invited from suitably qualified persons for the undermentioned appointments:—

(*a*) **ARCHITECTURAL ASSISTANT.** (Candidates must have passed Parts I and II of the R.I.B.A. Final or special Final Examination, or their equivalent at one of the recognised Schools of Architecture, and to have had at least 5 years' experience, including the period spent on theoretical training.) Special Grade (£650—£775).

(*b*) **BUILDING INSPECTOR** (A.P.T., Grade II, £560—£640).

(*c*) **JUNIOR ASSISTANT** (General/Higher General Division, maximum £400—£475), following probationary period architectural training, will be offered to a suitable candidate).

The appropriate London weighting allowance is payable in respect of each appointment (*i.e.*, £10 to £30 per annum, according to age).

The appointment will be terminable by one month's notice in writing on either side, will be subject to the National Scheme of Conditions of Service and the Council's General Conditions of Service relating to permanent staff made from time to time, the Local Government Superannuation Acts, and to the selected candidates first passing a medical examination.

Candidates must state whether to their knowledge they are related to any member, officer or employee of the Council. Canvassing will disqualify.

Forms of application may be obtained from the Borough Engineer, 7, Little Park Gardens, Enfield, and should be returned to the undersigned on or before noon, Saturday, 24th September, 1955, in an envelope appropriately endorsed.

CYRIL E. C. R. PLATTEN,
Town Clerk.
Public Offices, Enfield.
6th September, 1955. 2816

DERBYSHIRE COUNTY COUNCIL.
COUNTY PLANNING DEPARTMENT.

Applications are invited for the following posts:—

(*a*) **SENIOR ASSISTANT (ARCHITECT)**, A.P.T., IV (£675—£825).

(*b*) **JUNIOR ASSISTANT (ARCHITECT)**, A.P.T. II (£560—£640).

Applicants for post (*a*) should have passed the Final Examination of the Royal Institute of British Architects or have graduated in Architecture, and for post (*b*) have passed the Intermediate Examination of the R.I.B.A. Experience in the layout and design of estates and schemes of re-development is desirable for both appointments. Knowledge of statutory planning procedure will be an advantage, and preference will be given to applicants who in addition to the above hold a planning qualification.

Applications, together with one testimonial and the names of two referees, to reach the County Planning Officer, 8a, Bold Lane, Derby, not later than 31st October, 1955. 2809

THURROCK U.D.C. Engineer and Surveyor's Department require **JUNIOR PLANNING ASSISTANT**, salary Grade I, A.P.T. Division, appointment pensionable. Candidates to be neat draughtsmen, have experience in surveying and levelling, and possess some knowledge of development control. Applications, together with names and addresses of three referees, to Clerk of Council, Council Offices, Grays, Essex, by 27th September, 1955. Canvassing disqualifies. Applicants to disclose in writing relationship to any member or senior officer of Council. 2792

NORTHAMPTON.
SENIOR ASSISTANT ARCHITECT (HOUSING), GRADE A.P.T., V (£750—£900).

Particulars of appointment and Form of Application, to be returned by 28th September, may be obtained from Borough Architect, Guildhall, Northampton.

C. E. VIVIAN ROWE, *Town Clerk.*
2791

CITY OF BELFAST—EDUCATION COMMITTEE.

Applications are invited for the following posts on the Staff of the Education Architect (Donald A. Shanks, Dipl.Arch., A.R.I.B.A.).

(*a*) **ARCHITECTS, Class I:**

Applicants must be Registered Architects. Preference will be given to those with experience in modern school design. Previous local government experience is not essential.

The salary scale is £680 × £25—£980 × £15—£995 per annum, the minimum being linked to age 26, with one increment for each year up to 32. For applicants over age 32 the commencing salary will be determined at a point in accordance with the qualifications, ability, and experience of the successful applicants.

(*b*) **ARCHITECTURAL ASSISTANTS:**

Applicants must have the Intermediate R.I.B.A. or equivalent examination. Previous local government experience is not essential. The salary scale is £425×£20—£625 per annum. Commencing salary will be determined having regard to the ability and experience of the successful applicants.

The following conditions apply to these appointments:—

Superannuation contributions are payable at the rate of approximately 6 per cent. of remuneration. Reciprocal pension arrangements exist between the Belfast Corporation and Local Authorities in Great Britain and Northern Ireland.

Canvassing in any form will disqualify.

Application forms, etc., are obtainable from the Education Office, Academy Street, Belfast. Completed applications must reach the undersigned not later than 12 noon on Tuesday, 4th October, 1955.

JOHN DUNLOP, *Town Clerk.*
P.O. Box 234, City Hall, Belfast.
8th September, 1955. 2806

BOROUGH OF ROWLEY REGIS.
APPOINTMENT OF CHIEF ARCHITECTURAL ASSISTANT.

Applications are invited from suitably qualified persons for the above appointment in the Building Department, at a salary within A.P.T., Grade IV (£675—£825).

Applicants should be experienced in housing and other architectural works normally undertaken by a Local Authority, and experience of a direct labour building organisation would be an advantage.

The appointment will be subject to the provisions of the Council's Conditions of Service and the Local Government Superannuation Acts.

Applications, stating age, qualifications and experience, together with copies of two recent testimonials, should be sent to the undersigned not later than Tuesday, the 27th September.

JOHN HILTON,
Town Clerk.
Municipal Buildings, Old Hill, Staffs.
9th September, 1955. 2805

LINDSEY (LINCOLNSHIRE) COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.

Vacancies on the permanent staff for:—

(*a*) **FOUR ASSISTANT ARCHITECTS** (A.R.I.B.A.), Grade IV, £675—£825.

(*b*) **TWO ASSISTANT ARCHITECTS** (Inter. R.I.B.A.), Grade II, £560—£640, or (A.R.I.B.A.), Special Grade, £650—£775.

(*c*) **ASSISTANT QUANTITY SURVEYOR** (A.R.I.C.S.), Grade V, £750—£900.

(*d*) **HEATING ENGINEERING ASSISTANT**, Grade III, £600—£725.

(*e*) **ELECTRICAL ENGINEERING ASSISTANT**, Grade II, £560—£640.

(*f*) **THREE BUILDING INSPECTOR-SURVEYORS**, Grade II, £560—£640.

Applicants for (*f*) should be capable of preparing drawings and specifications for small works of additions and alterations.

Starting salary not more than two steps up grade may be granted in special circumstances. N.J.C. Conditions of Service. Canvassing will disqualify. Candidates must disclose in writing whether to their knowledge they are related to any member or senior officer of the Council. Applications, giving age, qualifications, experience, present salary, copies of two recent testimonials, to be sent to the undersigned not later than Friday, 30th September, 1955.

A. RONALD CLARK, A.R.I.B.A., A.M.T.P.I.,
County Architect.
County Offices, Lincoln. 2803

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

SENIOR ASSISTANT ARCHITECT required for work connected with large scale programme of rebuilding and new general hospital.

Applicants must be Associate members of the R.I.B.A., and have had considerable experience in a senior capacity in design and construction, preferably recent experience in design of hospitals and associated buildings. Salary scale £920 × £50 (5) × £25—£1,065 plus £40—£50 London Weighting, commencing at minimum.

Apply, giving age, qualifications (with dates) and experience, to the Secretary, North West Metropolitan Regional Hospital Board, 11a, Portland Place, W.1, by 26th September, 1955. 2814

KENT COUNTY COUNCIL requires an ASSISTANT in the PLANNING DEPARTMENT at a salary within the grade £500 × £20—£540 per annum.

Candidates must possess an appropriate degree or diploma or have passed a recognised professional intermediate examination. National Scheme of Conditions of Service applies and registered disabled persons will be considered.

Applications, together with the names of two referees, must reach the County Planning Officer, County Hall, Maidstone, not later than the 17th October, 1955. 2813

Architectural Appointments Vacant

4 lines or under, 7s. 6d.; each additional line, 2s.

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she or the employment is excepted from the provisions of the Notification of Vacancies Order, 1952.

ARCHITECTURAL ASSISTANT (not necessarily qualified), with some years' office experience, required for progressive Architect's office, Manchester district. Interesting and varied work, mostly contemporary. A high salary with good future prospects is offered to the successful applicant. Please apply with brief particulars. Box 2742.

ASSISTANT required in busy practice in West End, in early twenties, about Intermediate R.I.B.A. standard. Excellent opportunities for gaining all round experience. Box 1942.

RAMSEY, MURRAY & WHITE have a vacancy for ARCHITECTURAL ASSISTANT, about Intermediate standard, preferably with office experience. Salary according to qualifications. Apply 32, Wigmore Street, London, W.1, or telephone WELbeck 1409. 9223

WESTWOOD, SONS & HARRISON, F./F.R.I.B.A., urgently require a SENIOR ARCHITECTURAL ASSISTANT, A.R.I.B.A. standard, with office experience; also JUNIOR ASSISTANT. Apply in writing, giving qualifications, to 46, Baker Street, W.1. 1958

ARCHITECTURAL ASSISTANT required by Major Oil Company undergoing expansion, for its Sheffield office. Applicants should be of Intermediate standard, and must be capable of carrying out work on the design and re-modelling of service stations. Social Club, Pension and Life Assurance scheme, generous sickness benefits. Write, giving full details of experience, age and salary required, to Box 9262, quoting Ref. A.A. 588.

RONALD WARD & PARTNERS require several capable ARCHITECTURAL ASSISTANTS, with contemporary outlook and willing to use own initiative. Salary range £400 to £800. Interesting and varied work, home and abroad. Congenial working conditions. Apply 29, Chesham Place, Belgrave Square, S.W.1. Telephone: Belgravia 3361. 2135

ARCHITECTURAL ASSISTANTS (2) required in City Office with a wide and comprehensive range of commissions. Salary range £559—£832. Seely & Paget. Central 0321. 2256

ARCHITECTURAL ASSISTANTS interested in the field of Building for Atomic Energy could be employed by private consultants in London and should apply to Box 235, Glovers Advertising, 351, Oxford Street, London, W.1. 2453

EDINBURGH Office of David Carr & Stuart Matthew requires SENIOR and JUNIOR ASSISTANTS. Seniors must have considerable experience in running contracts, general design, planning and construction. Juniors should have good practical office experience and/or school qualifications. For interview write, giving brief particulars and salary required, to above firm at 14, Lynedoch Place, Edinburgh. 2396

SENIOR ASSISTANT required in Architect's Department of large London Industrial concern. Knowledge of London Building Acts and By-Laws an advantage. Good prospects; Pension scheme. State age, experience and salary required. Reply Box No. 2699.

ARCHITECTURAL ASSISTANTS required, all grades, for contemporary office. Salary according to experience. C. H. Elsom, F.R.I.B.A., 44, Catherine Place, S.W.1. Victoria 4304. 2695

JUNIOR ASSISTANT, competent to make measured surveys and prepare working drawings, required by Wallis & Smith, Chartered Architects, Basingstoke. Apply by letter, stating salary required. 2533

JUNIOR ARCHITECTURAL ASSISTANT required (male or female) in Architectural Dept. of old-established firm of Chartered Surveyors. Reply, stating full particulars of experience and salary required, to G. Scott Baird, L.R.I.B.A., 20, Salisbury Street, Blandford Forum. 2596

BENNETT, T. P., & SON, require qualified ARCHITECT, who combines a knowledge of construction with a high standard of draughtsmanship, to co-operate on industrial developments and other building projects. Apply 43, Bloomsbury Square, London, W.C.1. Telephone: HOLborn 9277. 2551

ARCHITECTURAL ASSISTANT (Senior or Inter. standard) required by Multiple Company in London. Full experience of surveys, working drawings, detailing and supervision of jobs. 5-day week, canteen facilities. Permanent and pensionable post. Apply in writing, stating age, qualifications, salary required, and experience, to Box 2518.

JUNIOR ARCHITECTURAL ASSISTANT, Intermediate grade, required Bournemouth office. Write, stating experience and salary required. Box 2517.

ARCHITECTURAL ASSISTANTS, Senior and Junior required, preferably with London practice experience, office and factory buildings. Write, giving particulars of experience, etc., to Messrs. Bates & Sinning, 89, Chancery Lane, W.C.2. 2508

APPLICATIONS are invited from suitably qualified and experienced persons for the posts of SENIOR and JUNIOR ARCHITECTURAL ASSISTANTS in the London office of this Organisation. Applicants must be first-class draughtsmen, possessing a sound knowledge of construction, materials, and contemporary design. Duties will be concerned with large scale housing and multi-storey flat design and layout, industrial educational and civic buildings. Salary in accordance with experience and ability. Requests for form of application to Kendrick Findlay & Partners, Chartered Architects, 36, Tavistock Square, W.C.1. 2556

ARCHITECT'S ASSISTANTS required in Brewery Estates Department. Minimum Inter. R.I.B.A. standard. Assistance with housing considered, if necessary. Apply, giving full particulars of age, qualifications, experience, and salary required, to Duncan Gilmour & Co., Ltd., 10, Nursery Street, Sheffield, 3. 2521

JUNIOR DRAUGHTSMAN and TRAINEE required by City firm. Must have had previous architectural drawing office experience or be attending recognised Course. Age 17/22 years. Salary £300—£400 p.a. Five-day week. Box 2504.

JUNIOR ARCHITECTURAL DRAUGHTSMAN required in City office. At least two years' drawing office experience essential. Interesting work on Office and Commercial buildings, giving scope for early advancement. Salary £500 p.a. Box 2503.

£600/£700 p.a. for competent ASSISTANT with good office experience for work of a contemporary nature in small congenial office. Five-day week. Telephone CITy 4086. 2810

GLOUCESTER.—Private Architect requires ASSISTANT. Intermediate R.I.B.A. standard. Must be interested in contemporary architecture and have some office experience. Also vacancies for JUNIORS or PUPILS. Five-day week, good working conditions and interesting and varied work. Apply with details of experience, salary required, etc., to Brian S. Tait, A.R.I.B.A., The Quay, Gloucester. 2802

MAX LOCK requires for job of exceptional interest, a first-class CHIEF ASSISTANT to accompany him to Basrah and to take charge of architectural work in connection with reconstruction projects. Salary according to experience and with profit-sharing arrangement. Preferably should be single and aged 27—32.

COMPETENT QUALIFIED ASSISTANTS are also needed in the London and Bedford offices of Max Lock & Partners. Apply in writing to 7, Victoria Square, London, S.W.1. 2801

GROWING young firm seeks ASSISTANTS of calibre. Only those interested in architecture need apply. Box 2808.

ARCHITECTURAL ASSISTANTS urgently required. Salary range £500—£850, for work on industrial projects in new town in Hertfordshire, on main line from London. Congenial office atmosphere, work of contemporary character. Good prospects for successful applicants. Assistance will be given in obtaining accommodation. Box 2705.

VACANCIES occur in busy London Architect's practice for JUNIOR ASSISTANTS. Salaries varying from £400 to £700, according to experience and capabilities. Reply with full particulars to Box 2498.

REQUIRED in small office Westminster, ARCHITECT'S ASSISTANT with Inter. R.I.B.A. Able to do working drawings to all scales. Salary by arrangement. Box 2683.

EXPERIENCED ASSISTANT required immediately. Good salary, prospects and working conditions. Small office, general practice. Please apply to Herbert J. Stribling, F.R.I.B.A., Nascott, Bath Road, Slough. Telephone Slough 22071. 2688

FAIRLY SENIOR ARCHITECTURAL ASSISTANT required in small Office in St. Albans. Must be able to produce good design and working drawings and be able to carry small and medium sized jobs through to conclusion under own initiative. Must be able to produce clear and concise specifications. Salary by arrangement. Apply: Taylor, Son & Bracken, 20, London Road, St. Albans. 2647

J. DOUGLASS MATHEWS & PARTNERS, Chartered Architects, 3, Ebury Street, London, S.W.1, require SENIOR and JUNIOR QUALIFIED ASSISTANTS. Seniors capable of leading design teams. Salaries in accordance with experience. 2646

ARCHITECTURAL DRAUGHTSMAN aged about 25 required by the Architects Department of major Oil Company. Candidates must have a good knowledge of building construction, be quick, neat draughtsmen, and a knowledge of perspective would be an advantage. There is an established Pension Scheme and Sickness Benefit Plan, and Luncheon Vouchers are issued daily. Salary will be paid according to qualifications and experience. Please apply, giving full details of career to date, together with salary required, to Box 2642.

ARCHITECTURAL ASSISTANTS, with ability and experience in houses and flats, competent draughtsman, capable of detailing, required. 5-day week. Permanent for suitable applicant. Write, stating experience and salary required, to R. Jelinek-Karl, F.R.I.B.A., 22, Chancery Lane, W.C.2. 2763

ARCHITECTURAL ASSISTANTS are invited to apply for vacancies which exist in the London Head Office of a leading Building Organisation. Initial salary in region of £750 per annum. Applicants should have Final R.I.B.A.

Young ARCHITECTS with Intermediate R.I.B.A. are also required. Commencing salary in region of £600 per annum. Write quoting reference A.A.A. and stating full details to Box 2760.

ASSISTANT ARCHITECTS required in Central London office. Knowledge of store construction an asset but not essential, providing the applicant has good all-round experience. Possibilities of future partnership not entirely ruled out for the right type of man. Write Box 2758, stating age, experience, and salary required.

LANCHESTER & LODGE require ASSISTANTS up to £600 per annum. 5-day week and lunch vouchers. Write full particulars, 10, Woburn Square, W.C.1. 2755

BRISTOL Architect requires ARCHITECTURAL ASSISTANTS, of Intermediate standard and Intermediate Final standard, for work on interesting projects of large scale. Applications from candidates with personality and enthusiasm, giving details experience, training, etc., to James W. Mackintosh, L.R.I.B.A., A.I.A.A., Chartered Architect, 2, Tyndall's Park Road, Clifton, Bristol, 8. 2754

JUNIOR ARCHITECTURAL ASSISTANT required, Intermediate standard, for busy practice in London West End. Opportunities for advancement and use of initiative. 5-day week. Apply E. H. Davie, A.R.I.B.A., A.M.T.P.I., Staff Architect, Hillier Parker May and Rowden, 77, Grosvenor Street, London, W.1 (Mayfair 7666). 2752

ASSISTANTS, about Intermediate R.I.B.A. standard, required by Architects with large general practice. Varied and interesting work. Men with ability and initiative encouraged to work with the minimum supervision. Pension Scheme available. Apply, giving age, experience, qualifications and salary required, to Box 2751.

MALE ASSISTANT required. Intermediate standard. 5-day week. Salary £400—£500, according to experience. Write to Murray, Delves, Atkins & Robert Pite, 14, Chantrey House, Buckingham Palace Road, S.W.1. 2749

ARCHITECT in City Office of large organisation requires ARCHITECTURAL DRAUGHTSMEN, with several years' drawing office experience. Must be quick, neat and accurate. Salary £500—£700, according to experience. Applications, stating age, qualifications, detailed experience, and present salary, to be addressed to Box 2748.

IMPERIAL CHEMICAL INDUSTRIES, LTD., Metals Division, has a vacancy for an ARCHITECTURAL ASSISTANT for design and detail work connected with the development of Industrial Buildings. Applicants should be of Intermediate standard and Civil Engineering experience would be an advantage. Application forms may be obtained from the Staff Manager, I.C.I. Metals Division, Kynoch Works, Witton, Birmingham, 6, quoting ARC/2. 2747

MESSRS. CLIFFORD CULPIN & PARTNER require TWO ASSISTANTS at approx £650—£750 p.a., also TWO JUNIORS at approx. £500. Interesting and varied work, including Civic and office buildings, schools, multi-storey flats, etc. Write 3, Southampton Place, W.C.1. 2776

SIR JOHN BURNET, TAIT & PARTNERS have vacancies for SENIOR and JUNIOR ASSISTANTS. Write, giving particulars, to 10, Bedford Square, W.C.1. 2777

LONDON office requires experienced ARCHITECTS for supervisory duties. Posts available at £1,000 and £1,400 per annum. Car facilities or expenses will be paid, and the successful applicants will be required to control large contracts. All applications will be dealt with in absolute confidence, and the applicants should reply with full particulars of their training and experience, and should state for which post they are applying. Box 2779.

VACANCIES for INTERMEDIATE and JUNIOR ASSISTANTS in busy office adjoining Oxford Circus. 'Phone Duke & Simpson, Langham 7317/8. Interviews can be arranged outside office hours if more convenient. 2780

LONDON Brewery Architect requires capable ASSISTANT, with special experience of working drawings and specifications. Good opportunity for right man. Age, salary and details to Box 2795.

ARCHITECTURAL ASSISTANT, Intermediate standard, required. Apply, giving particulars of age, experience, and salary required, to J. W. Cameron & Co., Ltd., Lion Brewery, West Hartlepool. 2782

QUALIFIED ASSISTANT wanted immediately for South Coast branch office. Interesting contemporary work. Box 2781.

ARCHITECTURAL DRAUGHTSMAN.
ESSO PETROLEUM CO., LTD., have a vacancy in their London Divisional Office for a JUNIOR ARCHITECTURAL DRAUGHTSMAN.

Applicants should be capable of carrying out surveys, preparing working drawings, and have had at least 3 years' experience in this type of work. There will be opportunity in due course for promotion to a higher grade.

Applications should be sent to the Employee and Public Relations Manager, London Division, 101/104, Piccadilly, W.1. 2786

WATES, LTD., offer permanent and progressive posts for ASSISTANTS in their Architects Department. The company has an interesting programme of housing work of all kinds, and of commercial buildings, and applicants should preferably have some experience in these fields. Five-day week, pension scheme, good salaries according to ability.—Write, stating age, education, qualifications and experience to the Architect, Wates Ltd., 1258-60 London Rd., Norbury, S.W.16. 2800

JUNIOR ASSISTANT required for busy country practice. Please write stating experience and salary required to D. Mervyn Edwards & Moreton, L/A.R.I.B.A., A.I.I.A., 5, Lower Brook Street, Oswestry. 2799

ASSISTANT, preferably with some experience, required for varied and interesting work. Salary £500—£700 range, plus bonus. Write Oliver E. Steer, A.R.I.B.A., 19, Hatherley Road, Sidcup, Kent. 2714

SENIOR and JUNIOR ARCHITECT'S ASSISTANTS required for Staff Architect's Department at Head Office of Dolcis Shoe Co. Inter. R.I.B.A. or equivalent standard required; keen interest in contemporary store design and enthusiasm for hard work. Canteen, sports/social club, and non-contributory pension scheme. Please apply in writing to Dolcis Shoe Co., 7-13, Great Dover Street, S.E.1. 2730

ASSISTANT wanted, to accept reasonable responsibility in small but busy country office. Salary £600 to £700. Please write to Gray & Ballinger, Chartered Architects, 24, Bird Street, Lichfield. 2725

GOLD COAST.—ARCHITECTURAL ASSISTANT required for small private office in Accra. Salary according to ability and experience. Furnished accommodation and car provided. Write, giving details of experience, to Box 2723. Interviews in London will be arranged.

SENIOR ARCHITECTURAL ASSISTANTS required by the J. Arthur Rank Organisation to work in London. Applicants must be at least 25 years of age, with design experience and extensive knowledge of modern building construction and finishes. Must have a Final or Intermediate R.I.B.A. The appointment is permanent and pensionable. Canteen. 5-day week, and other amenities are available. Write, stating age, details of training and experience, and salary required, to Personnel Dept., 142, Wardour Street, W.1. 2722

COMPETENT ARCHITECTURAL ASSISTANT, Intermediate standard, required in small London office. Able to take charge of small contracts. Reply stating experience and salary required, to Box 2721.

ERIC LYONS requires experienced SENIOR ASSISTANT. Write brief particulars to Mill House, Bridge Road, Hampton Court, Surrey. 2720

CAPABLE ASSISTANT required for private practice in Westminster. Applicants must be good draughtsmen, capable of working on their own initiative, and have practical experience of administering contracts. Salary according to age and qualifications. Write, stating age and previous experience, to Box 2717.

EAST MIDLANDS.—SENIOR ASSISTANT required in small progressive office for varied work, including Schools. Excellent opportunity for experience and initiative. Car driver preferred. Box 2719.

ARCHITECTURAL ASSISTANT.—£600—£800 per annum offered for Assistant, to take part in development and re-modelling of petrol filling stations, garages and workshops, etc. Must be capable of working independently and be prepared to accept responsibility. Should be of Intermediate standard. Work will involve original design, site visits, and a high standard of presentation. 5-day week, good pension and life assurance scheme, sickness benefits, and free luncheon vouchers. Social club. Write, giving full details, stating age, experience, and salary required, to Box 2718, quoting Ref. AA 824.

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ARCHITECTURAL ASSISTANT, with some industrial experience, required in London office of a large industrial organisation with factories throughout the country. 5-day week, but occasional travelling involved. Good future and prospects to right applicant, including first-class pension scheme. Write, giving brief particulars of experience, age, etc., and salary required, to Box 2715.

ARCHITECTURAL ASSISTANT required for Architect's Department. Qualifications not less than Intermediate standard. Good prospects. 5-day week. Write, giving age and salary required. Personnel Dept., George Ellison, Ltd., Perry Barr, Birmingham 22B. 2708

GRANADA THEATRES require permanent services of young ARCHITECTS, recently qualified. Good opportunities in interesting work exist for those with drive, imagination, and initiative. Applications, stating age, qualifications, experience and salary required, to Managing Director, Granada Theatres, Ltd., 36, Golden Square, London, W.1. 2712

ARCHITECTURAL ASSISTANTS, also DRAUGHTSMEN, required for work on new system of prefabrication for schools, hospital buildings, etc. Permanency. Superannuation scheme available. Write or telephone, stating age, experience, salary required, J. Thorn & Sons, Ltd., Brampton Road, Bexleyheath, Kent. ('Phone 305.) 2741

SENIOR ARCHITECTURAL ASSISTANT required, capable of preparing working drawings from sketches and supervising work, in Southampton area. Applicants should give details of experience and salary required to Gutteridge & Gutteridge, 45, Westwood Road, Southampton. 2743

TAYLOR WOODROW HOMES, LTD., require an ARCHITECTURAL ASSISTANT (Intermediate standard) for large scale housing development. Must be capable of producing full working drawings. Pensionable post. Write, giving full details of experience, etc., to Personnel Department, Ruislip Road, Southall, Middlesex. 2737

YOUNG Architect, with small but interesting and varied practice, in West London office, requires ASSISTANT, of Inter. or Final standard. Write experience, salary, age, to Box 2735.

ARCHITECTURAL DESIGNER/DRAUGHTSMAN required (age 25-30) by Ashmore, Benson, Pease & Co., Stockton-on-Tees. Must be experienced in the preparation and layout of industrial buildings, etc. Apply, stating age, experience, salary required, quoting reference A. 2734

ASSISTANTS required, about Intermediate standard; salary according to experience. Apply in writing to J. Brian Cooper, F.R.I.B.A., Coleridge Chambers, 177, Corporation Street, Birmingham. 2733

ASSISTANT ARCHITECT required for interesting work. A.R.I.B.A., with some experience. Starting salary £750 to £900, according to ability. Apply in writing to J. Brian Cooper, F.R.I.B.A., Coleridge Chambers, 177, Corporation Street, Birmingham, 4. 2732

DEREK BRIDGWATER & PETER SHEPHEARD require an ASSISTANT ARCHITECT, either fully or partly qualified, with some office experience. Apply in writing to 42, Bruton Place, W.1, giving brief details of age, qualifications, experience, etc. 2731

ARCHITECTURAL ASSISTANT required, up to at least intermediate standard, Westminster Office. Pension and bonus schemes, five-day week. Write stating experience, age and salary required. Box 2656.

ARCHITECTURAL ASSISTANTS required, Intermediate and Final stages, for Charing Cross office. Please write for interview, Box 2706.

SENIOR ARCHITECTURAL ASSISTANT required for expanding contemporary practice, must be qualified. C. H. Elsom, F.R.I.B.A., 44, Catherine Place, S.W.1 VICtoria 4504. 2621

LEWELLYN SMITH & WATERS invite applications from (a) QUALIFIED ARCHITECTS to take charge of large industrial projects. Experience of job management and knowledge of present-day constructional forms is essential. (b) QUALIFIED and UNQUALIFIED SENIOR and JUNIOR ASSISTANTS to work on these and other projects. (c) In Worcester Office, ASSISTANT of R.I.B.A. Inter. Standard with three years' office experience. Preferably with experience of job supervision and specifications.

Salary according to experience and ability. Write 103, Old Brompton Road, S.W.7. 2623

VACANCIES exist for LEADING ASSISTANT ARCHITECTS on British Railways at York. Applicants must be Chartered Architects and have ability in architectural design, knowledge of modern building technique and have had some experience of the control of a small staff. Salary range £950/£1,000.

A vacancy also exists for an ASSISTANT ARCHITECT who should be a qualified Architect, or if not, have had several years' experience. Responsible for sketches and working drawings under supervision for smaller jobs. Salary range £720/£780.

Applications in writing, giving age, experience, qualifications, etc., to the Chief Civil Engineer, British Railways, North Eastern Region, York. 2625

ARCHITECTURAL ASSISTANT required; Intermediate Standard or above, an interesting variety of work. Some office experience essential. Salary according to age, experience, etc.: George Watt, A.R.I.B.A., 146, Mostyn Road, S.W.19. Liberty 8181. 2658

ARCHITECTURAL ASSISTANT required up to Intermediate R.I.B.A. Standard, for Housing and Estate work in West End Office. Salary £300 to £400 p.a., according to qualifications and experience, with prospects for advancement. Apply Percy Bilton Ltd., 113, Park Street, W.1, or Tele: May 8240. 2654

STRUCTURAL DESIGNER; ARCHITECTURAL ASSISTANTS; GENERAL CIVIL ENGINEERING ASSISTANTS; DRAUGHTSMEN (including Structural, Heating and Ventilation, etc.).
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Those wishing to apply, should write for official Application Form (stating which vacancy is being applied for) to:—

Personnel Superintendent, The Steel Company of Wales Limited (Steel Division), Abbey Works, PORT TALBOT, Glam. 2655

YOUNG ASSISTANT required to Staff Architect of progressive combine with H.Q. in London and branches throughout the country. Able to run small contracts and to work with minimum of supervision. Occasional travelling involved. Contributary superannuation scheme. Write giving full details to Box 2631.

ARCHITECTURAL ASSISTANTS of Final and Intermediate standard required in private practitioner's office, Glasgow. Salary £450—£900 per annum dependent on qualifications and experience. Box 2632.

ARCHITECTURAL ASSISTANT required for London Office with varied practice, including Hospital and Industrial buildings. Salary up to £850, according to qualifications and experience. Five-day week. Good prospects and scope for suitable applicant. Apply stating age and experience to Box 2678.

SENIOR and JUNIOR ASSISTANT ARCHITECTS required, S.W.1 architect's office. Commencing salary £950 and £850 respectively, superannuation, luncheon vouchers and five-day week. Box 2616.

ARCHITECT'S ASSISTANT required by Brewery Architect to take charge of small office. Splendid opportunity for advancement for young man not necessarily qualified. State salary, age and experience, to ARCHITECT, Box 2619.

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ARCHITECTURAL ASSISTANTS wanted in general London practice. Intermediate standard or above. Please apply with details of experience, age and salary required to David A. Wilkie & Partners, 45, Chancery Lane, W.C.2. CHAncery 6460. 2676

COVELL AND MATTHEWS urgently require ARCHITECTURAL ASSISTANTS. Salary range £750—£900. Work is varied and interesting including Hospitals, Churches, Housing. Five-day week. Apply in writing to 34, Sackville Street, London, W.1. 2675

THE London Hospital, Whitechapel, E.1, requires JUNIOR ARCHITECTURAL ASSISTANT. Salary £440 to £650 p.a. according to experience, plus London weighting. Post superannuable. Applications stating age, present salary and brief particulars of experience to be sent to the House Governor. Accommodation is available in Kensington if successful candidate is a woman. 2677

ARCHITECT'S ASSISTANT, with previous office experience, required immediately. Varied and interesting work. Write, stating age, experience, and salary required. Arthur J. Penberthy, F.R.I.B.A., 74, Bath Road, Wolverhampton. 2771

JUNIOR ASSISTANT, quick, neat, draughtsman, required for progressive position in Architects' Dept. of Multiple Company in London. Excellent conditions, 5-day week, staff canteen. Salary in the region of £400, according to experience. Replies to Box 2770.

Architectural Appointments Wanted

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ARCHITECT'S SENIOR ASSISTANT, over 20 years' experience in all branches, seeks post of responsibility with view to eventual partnership in London Office (non-Jewish, please). Special Final standard in practical matters but a little rusty on design due to many years of administration and supervision. Over ten years with present office but dissatisfied with series of broken promises. Not less than £800 p.a. for five days WORK per week and three weeks holiday (none required, 1956). Willing to bring in own clients if arrangements work out congenially. Would be prepared to go in with younger man setting up practice (at above salary) if interest in WORKING. Honour-bound to give present office adequate notice. Box 2668.

F.R.I.B.A., school and office trained, with 27 years' practical and administrative experience in England and Overseas, seeks appointment in London or the South. Salary £1,200—£1,500. Box 2789.

DIP. ARCH., A.R.I.B.A. (35), 12 years' varied experience and responsibility, desires post with Partnership prospects, South half of country. Box 2728.

A.R.I.B.A. (35), N.E. Coast, desires change which would give independence and responsibility, such as Company Architect or Resident post. Present salary £800. Box 2727.

A.R.I.B.A. (female), school diploma, able to take charge of contracts from sketch plans to final accounts, seeks position along South Coast giving opportunity for initiative and responsibility. Box 2726.

A.R.I.B.A. (40), enthusiastic, 24 years, experience on all general types of buildings, desires position in London area as CHIEF ASSISTANT, where his ability and administrative experience can be utilised. Salary required £1,200, with prospects of bonus on work executed. Box 2756.

ARCHITECT (35), A.R.I.B.A., Staff Architect to large combine, desires more progressive position in Commercial, Industrial, or private practice. Chief Assistant in large private practice prior to present appointment. Varied experience. Capable of taking full charge of office administration. Salary not less than £1,200 per annum. Box 2759.

ARCHITECT (30, single), car owner, with knowledge of French and Spanish, seeks appointment requiring creative ability and initiative and involving travel abroad. Box 2744.

Other Appointments Vacant

4 lines or under, 7s. 6d.; each additional line, 2s.

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she or the employment is excepted from the provisions of the Notification of Vacancies Order, 1952.

ASSISTANT BUILDING SURVEYOR required for the Sheffield Office of a major oil company undergoing expansion. Applicants should have a sound knowledge of building construction and bye law requirements, and be capable of carrying out surveys, preparing drawings and specifications relating to service stations. Pension and Life Assurance Scheme, generous sickness benefits, Social Club. Write, giving full details and stating age, experience and salary required to Box 1594, quoting Ref. ABS/S 720.

ASSISTANT QUANTITY SURVEYOR required by major oil company in Sheffield branch office. Applicants should be prepared to act on own initiative for the preparation of approximate estimates, interim certificates and final accounts for contracts up to £10,000. Salary range to commence £600—£700 per annum. Pension and Life Assurance Scheme, generous sickness benefits, Social Club. Write, giving full details of experience, age and salary required, to Box 2436, quoting Ref. AQS/S798.

QUANTITY SURVEYOR.—West Country firm of Architects seek services of qualified and active QUANTITY SURVEYOR. Opportunity and prospects in independent or associated practice. Office accommodation and small flat available. Write in first place, giving full information of training, experience, age, etc., to Box 2613.

QUANTITY SURVEYOR required by the Steel Company of Wales, Ltd., Abbey Works, Port Talbot, to fill a vacancy on the permanent staff of the Civil Engineering Department.

Applicants should be thoroughly experienced in all branches of quantity surveying applicable to Building and Civil Engineering work, and be familiar with contract procedures and have a good knowledge of cost control and cost record keeping. Preference will be given to Corporate Members of the Royal Institution of Chartered Surveyors (Quantities Section).

The position is pensionable, and salary will range between £900 and £1,000 per annum, according to qualifications, experience, etc. The successful candidate will be assisted in finding suitable housing accommodation.

Those wishing to apply should write for an official application form to:

PERSONNEL SUPERINTENDENT,
The Steel Company of Wales, Ltd.,
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Abbey Works, Port Talbot. 2713

A WELL-KNOWN Company, concerned with both the supply and erection of its building materials, requires to appoint a qualified REPRESENTATIVE (age 28/38), preferably resident in the Newcastle area, for promotional work amongst Architects, Surveyors and Engineers. Preference will be given to applicants having architectural experience who wish to enter industry. The position offers permanency, progression and pension facilities. Please write in the first instance, giving details of age, education and business or professional background, to Box 2761. Those not having the above qualifications are requested not to apply.

BUILDING SURVEYING ASSISTANT (about R.I.C.S. Final standard), with 4 years' practical experience, required by City firm of Chartered Surveyors and Architects. Box 2775.

CLERK OF WORKS required Shirley, Birmingham, 6, for approx. 12 months from 1st October. Interview London. Salary by arrangement. Goldfinger, 69—70, Piccadilly, W.1, HYDe Park 5210. 2815

DRAUGHTSWOMAN/TRACER (JUNIOR) required by large undertaking for employment in North London. Work consists of preparation and maintenance of plan register of properties, tracing and colouring building and architectural drawings, and preparing tracings in connection with the letting and sale of land and buildings. Commencing salary dependent upon age and experience, but not less than £315 per annum. Write, stating age, qualifications and experience, to Box T.289, c/o Streets, 110, Old Broad Street, E.C.2. 2767

BEDS. — QUANTITY/MEASURING SURVEYOR, with previous experience, from Builder's office, wishing to enter private practice. Experience in preparation of Bills of Quantities, Site Supervision, Interim Valuations and Final Accounts. Excellent opening for keen and energetic man. Give details of past and present employment, age, etc., in strict confidence, to Box 2784.

SOUTH-WEST AFRICA.—Qualified or unqualified SENIOR ASSISTANT for Windhoek or Walvis Bay. Experience working drawings essential. Commencing salary £60; fare out, etc. Apply, quoting OSS.83/2, Overseas Technical Service, 5, Welldon Crescent, Harrow. 2772

CONTEMPORARY DESIGNER, ARCHITECTURAL ASSISTANT required by Nairobi Architect. Recently qualified school man of honours or distinction standard might well suit. Age pref. 25-30, some practical experience valuable, initial salary £80 per month, passages paid, etc. Apply, quoting OSS.70/2, Overseas Technical Service, 5, Welldon Crescent, Harrow. 2773

BUILDING SURVEYING ASSISTANT (about R.I.C.S. Inter. standard), with 2 years' practical experience, required by City firm of Chartered Surveyors and Architects. Box 2774.

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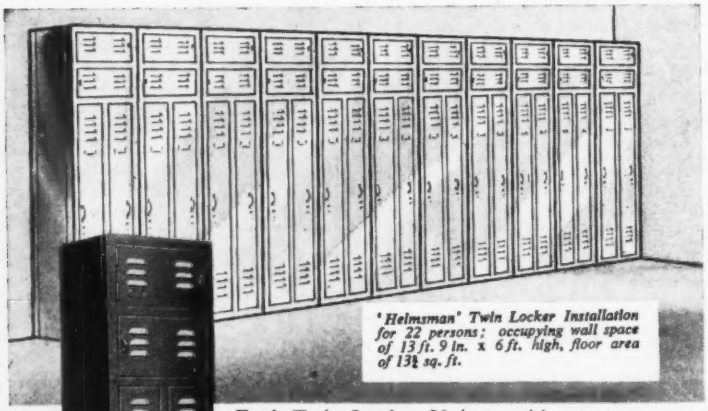
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